The Builder.

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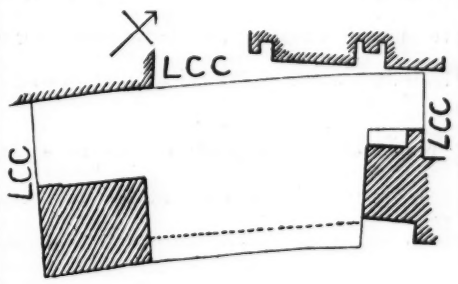
The Municipal Lodging-House Competition.

THE scheme of the London County Council for building a common lodging-house on a portion of the ground acquired by them in the neighbourhood of Drury-lane is partly the outcome of the fact that a considerable proportion of the former tenants dispossessed in clearing the land were keepers of common lodging-houses, and this scheme is giving back to the site the same kind and extent of accommodation under better and healthier arrangement. It is also to be regarded as a financial experiment which may have important results, according to its success or failure, in encouraging or discouraging the undertaking of the same kind of enterprise by private speculation. It is estimated that if this building, including fixtures, is erected at a cost not exceeding 10,000*l.*, this will allow sufficient margin, after paying costs of management and maintenance, to provide a moderate return of interest on the total cost of land and buildings; but competitors were advised that cheapness would weigh materially with the assessors if combined with efficiency, as one object with the Council was to lead companies and others to enter into similar undertakings. What precise return the County Council expect to get from the buildings, on the basis of a 10,000*l.* expenditure, they do not state, and the word "moderate return" is rather vague.

Half the drawings submitted in the competition, including also all the four premiated sets, have been on view this week in what is called the "Grecian Room" in the County Council offices; a room which deserves a word in passing, as it is part of a house occupied once by Decimus Burton, and this room was specially designed by him for his own use and enjoyment. It is lighted by a large elliptical skylight, and the walls are adorned with a small reproduction of the Parthenon frieze. The reason that only half the drawings are exhibited is merely want of space, the other half are to be exhibited next week. The selection has been made strictly in numerical order, and the drawings were numbered in the order in which they were delivered on sending-in day; but an exception has of course been made in the case of the premiated designs, all of which were shown this week, and will we presume be shown next week.

The plot of ground on which these buildings are to be erected is an irregularly-shaped one adjoining Parker-street, a narrow street which runs parallel with Great Queen-street a little higher up, and which formerly had an evil reputation as a street dangerous to the casual visitor. It is something to see even a portion of the old buildings in this neighbourhood cleared away and fresh air and light let in, and it is to be hoped that this is only an instalment of a general clearance and rehabilitation. Even in adjoining streets which are quite respectable, and occupied by small shops, the whole atmosphere in this region between Great Queen-street and Holborn seems to reek with the accumulated smell of the dirt and decaying matter of generations. The shape of the site is shown on the accompanying plan, Parker-street running along the lower side of it: the dotted line parallel with the street shows the line of frontage which is to be observed, beyond which, however, porches or other such additions may project to a moderate extent not further defined in the instructions. Efforts have been made to acquire the two blocks of property at the angles, but unsuccessfully. Consequently the site is composed of a central space and two wings, which wings have little opportunity for side light, as even in regard to the open spaces adjoining, which are also the property of the L.C.C., competitors are warned that they must not count upon light from those quarters. This condition of the site almost inevitably points to a plan keeping the higher portions in the central area and treating the remainder for one-story buildings lighted from above; and this is the system, in one way or another, adopted by most of the competitors, though some have managed to depart from it to some extent.



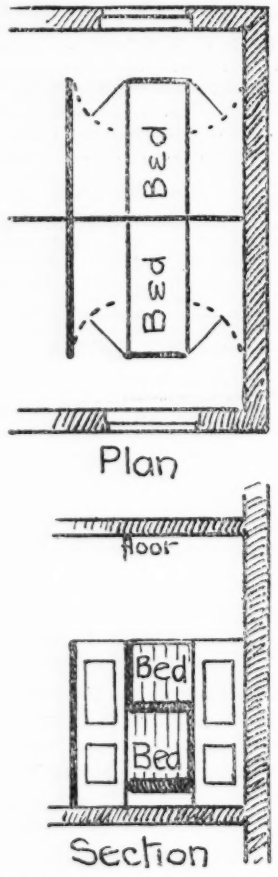
The requirements, omitting minor details, are as follows; sleeping places or dormitories for 350 men, with a minimum of 350 cubic feet of air space for each person; a sitting-room or day-room adapted also for entertainments; a dining-room with open fireplaces and a kitchen adjoining with scullery; a grocery bar or shop; a series of lavatories and baths, with twelve troughs for feet washing; a yard at the rear for ventilation and occasional exercise, not less than 450 superficial feet; an office, to have good command of the rooms used by day, especially of entrance, staircase, day-room, and dining-room. These are the items in the requirements which most directly affect the system of plan adopted.

A premium of 100*l.* was to be awarded to the successful competitor, and 100*l.* to be divided among other competitors "if the circumstances warrant it." The actual awards we published last week: they are certainly "warranted." In regard to the selected plans we believe there is little doubt that they will be carried out, and shortly. The Council are very well satisfied with them, and desirous to put the experiment into practice without delay.

The first premiated plan, No. 3, by Messrs. Gibson and Russell, places the day-room and dining-room at right angles to Parker-street, running across the wide portion of the site from the front towards the back, the kitchen occupying part of the space behind the dining-room. Between them is a space not quite so wide as either of the big rooms, appropriated to entrance and entrance-hall, office (which is placed almost in the central spot of the building), and the open yard before referred to as one of the requirements. At the back of the building a long low range of rooms parallel to Parker-street furnishes the space for lavatories, washhouses &c. These run into the bay of the site on the right, but that on the left is kept clear for future extension. The placing of the open yard on the centre line and forming the communication between the front portion of the building and the lavatories is a very good point; it affords side-light to the back portion of the dining-room

and day-room, and it cuts off the lavatory department from these by the interposition of an open-air lobby, as we may call it. The whole of the centre space between day-room and dining-room is entirely open above, except that at the end next the entrance from the street the staircase is carried up. The dormitories consist of two high blocks of building running from front to back, rising over the day-room and dining-room, and reached by the stairs near the entrance point. The arrangement of these dormitories is the best point in the plan, and the one which probably more than any other contributed to gain the authors the first premium. Each block, from the point above the first-floor level, forms one large hall with railed galleries round it on the levels of what would be the floors if it were completely floored, and an entirely open space up the centre. These galleries are surrounded with small cubicle partitions with an aisle for passage between them and the railings; the partitions of course do not go up to the ceiling; each cubicle has a door and a little floor space opposite the door, and a window corresponding with the size of the door, the partition between the cubicles running into the centre mullion of the window: the bed is on one side. For sanitary conditions this seems the best arrangement possible. As the two dormitory blocks are entirely uncumbered with buildings at the side, except the small stair block at one end, there is complete through ventilation with opposite windows, on each gallery level; the large central space leaves abundant room for aeration, and the whole can be ventilated as one hall. The glass house for the warder, placed on the bottom level of the dormitory, is the only thing open to question, as the warder could not from that position see much that was going on in the upper galleries. If inspection by the warder is really considered necessary, he should have a lift by which he could easily mount from gallery to gallery. But in the main the arrangement of this portion is admirable, and we have seen nothing else so good among the plans exhibited this week. The elevation is very plain; a certain effect is given by treating the ground storey as a lofty basement, with the large semicircular windows of the day-room and dining-room forming prominent features in it: a little more might have been done with the upper portion, however, as far as appearance is concerned, without running into any extravagance in money.

The various systems of arranging the beds in the dormitories form an important distinguishing feature in the plans, and may be grouped into four classes: 1st: beds simply placed on the floor without any partitions. 2nd: beds with partitions at the heads, or at the sides also. 3rd: a separate cubicle for each bed, with a door. 4th: what may be called the Glasgow method, which is represented in the accompanying plan and section. Each bed on plan has two doors to it; but, as the section shows, one door gives access to a bed on the floor or nearly so (a space of 6 in. is left under for sweeping), the other door gives access to a bed which is half-way up the height of the cubicle; a half partition shuts out each bed from the other side, and the inmates lie over each other as in the berths of a ship. This method has been adopted in Glasgow common lodging-houses, and appears to be a favourite there; it has the merit of being very economical of floor space, and therefore has advantages in this sense in cases where area is limited but where height is practically unlimited: and there its advantages, to our thinking, begin and end. In a part of the kingdom where the lower orders have been accustomed to the "but and ben" style of house, in which the sleeping accommodation is arranged in recesses in the living room, or where, as a story goes, tenants who were given a three-roomed cottage shut up two rooms and slept in the cupboards of the third one, this arrangement may recommend itself as convenient and practical. In England we think most sanitarians will agree with us that as a method of housing for the night a large number of persons presumably unclean in person, with the condition of keeping the places so occupied clean, healthy, and well ventilated, it is one of the very worst and most pernicious that could be employed; it fills a place with dark corners,



The Glasgow System of Cubicle.

and makes a series of pockets for the lodgment of vitiated air. It would be possible to make the half-partitions to unlock and hinge up so as to get a current through in the daytime when the dormitory is not in use; we do not know whether this is done; but even then the insanitary result is the same at night. You cannot do a worse thing for a sleeper than put him to sleep in a close cavity or cupboard; it is a most unhealthy arrangement for any one, rich or poor; and though the class who use common lodging-houses have no right to expect luxury, they ought to have sanitary conditions; it is a mockery, while we are trying to teach the poor to be sanitary, to expose them to insanitary conditions in the officially-installed lodging-house. Yet this most objectionable arrangement seems to have fascinated a number of the competitors, who have probably been tempted to use it in the hope of thereby "beating the record" in regard to price per cubic foot.

In No. 51, by Messrs. Hopton & Williams, to which a premium of 40*l.* has been awarded, the dormitories are arranged in a long block parallel with Parker-street, the front portion of the building being carried up and the whole of the back portion left one-storied and lighted from the top. The authors employ two double rows of cubicles with aisles in the centre and against the walls, running lengthways of the building, the cubicles are on the Glasgow system which we have just characterised. The entrance is oddly arranged on the right, leading into a right-angled corridor running round two sides of the day-room; a very bad arrangement, as the corridor would be a regular lurking and larking place, and could not be under efficient supervision. The author indicates an alternative entrance in the centre, pushing the day-room to the right. The advantage of the proposed plan of corridor is a very compact arrangement of the rooms in the central portion of the ground floor, the day room and dining room being got nearly corner to corner, with the office dove-tailing into them and commanding each of them and the staircase. The lavatories and kitchen are in the space to the left, but apparently the lavatories are only accessible through the dining room; a very bad arrangement, if that is what is meant, and we cannot see otherwise. On the whole we cannot quite understand the position accorded to this set of plans.

No. 19, by Messrs. Chorley & Cannon, obtains a premium of £30. There is a great deal of merit in this plan; the drawback to it is that it is expensive. The ground plan is very simply arranged; the day-room and dining-room are placed symmetrically on each side of a central entrance; the office is close to the entrance, and commands day-room and dining-room well, but not the stairs, which are round the corner. The lavatory department is arranged along the back of the building, which is not however carried to the back of the site, where a strip of ground is left open for yards. The dormitories are arranged in a long longitudinal block running over the lavatory block at the back, and with three arms running from it transversely to the front at Parker-street, with open spaces of equal width between them, above the ground-floor buildings. This long range of dormitories contains a row of single cubicles along each wall, with a gangway in the centre, and all the blocks have window ventilation at both sides. The objection to the plan, which is simple and sanitary, is that the plan of the dormitories, collectively taken, renders inspection difficult, and that there is a good deal too much heavy wall-building for economical conditions. The architects' real point is when we come to the Parker-street front, for there the ends of the three side blocks of dormitories form three gables, rather picturesquely treated, fronting the street, with open spaces between them for sun and air to get down. This is far better, as abutting on a narrow street, than a continuous line of high wall; and we can only regret that a design which shows such a good point as this should be ineligible in some other ways.

No. 70, by Mr. T. Locke Worthington, which receives a premium of 30*l.*, fills up the site very much on the ground floor, which however is well arranged. There is a central entrance leading into a large square hall, the office being placed in the middle of it, and having full command of the day-room and dining-room doors, which are on the right, and of the stairs, which are on each side of the entrance. The dormitories form a longitudinal block running along the Parker-street front, as in No. 51, also with "Glasgow" cubicles, a double row back to back down the middle, and a single row down the walls with a gangway between. Behind the single row of cubicles, which do not come quite up to the wall, is a narrow causeway for inspection, getting at pipes, opening windows, &c. The back portion of the site is entirely occupied by one-story buildings lighted from the top. A corridor leads from the left of the entrance-hall to the left-hand portion of the site, which portion is utilised as the open yard. On the whole this plan appears to us more meritorious than either 51 or 19.

The majority of the drawings shown already are a good set, and seem to have had no little care and thought bestowed on them. Though we have not noticed any which came at all near to No. 3 in the practical treatment of the problem, a few which exhibit some special features may be mentioned. In No. 8 the ground story is placed partially underground, or made a basement half above ground, no doubt with the intention of economy in cubic contents. This is a method which is worth consideration where it is necessary to keep down the cost of a building in every reasonable manner in order to obtain an adequate return for the outlay, but it is not to be recommended if it can be avoided. The designer places the dormitories in two long parallel blocks the whole length of the site; the objection to this is that the southern block is in the other's light, and there is a long deep trench between in which air would tend to

become stagnant on still days. In No. 9, by Messrs. J. W. C. Atkinson and W. H. Sugden,* the dining-room and day-room are kept at the back and top-lighted, and the dormitories above them are placed transversely between the skylights, branching out on each side of a long central corridor, with a small room out of the passage for a warder, who can thus patrol and keep an eye on all the wards; a plan which has merits in the way of division and supervision combined; but it is somewhat costly. The elevation aims a little more at effect than some of the others. Messrs. Newman & Newman (No. 13) place the dining-room and day-room on opposite sides of the front, and make the centre alley between a cartway or covered street, with steps up to the doors opening from it. We do not see the motive for this exactly; the cart passage is for the bringing in and out of stores, clothing, &c., we presume; but it would be very inconvenient to go down steps from the day-room and up steps again to dining-room and *vice versâ*, and the cart-passage or street would be a regular lounging-place. Messrs. Malcolm Stark & Rowntree (No. 21) place their cart-passage on the left of the whole front block, so as not to interfere with it; their plan is a good and simply-arranged one, placing dining and day-rooms in parallel blocks at right-angles to Parker-street, with the entrance-hall, staircase, and office in a small connecting block between them. The dormitories are formed in the same blocks carried up. The plans of No. 35, by Messrs. J. W. Dunford and R. L. Pearce, have been prepared with great care, and have several good points; the day and dining-rooms are arranged on each side of a central corridor which leads through to the staircase, and thence to the lavatory department which forms a long block at the back, while a passage outside of it leads to the exercising-yard in the left bay of the site. The office is well placed in a corner of the day-room, commanding the whole of it, the stairs and passage, and the door of the dining-room. The dormitories form one large longitudinal block above, parallel with Parker-street. Both these and the last-named competitors employ the Glasgow method of arranging the cubicles.

There are no detail drawings of warming and ventilating arrangements, and as the descriptions are not affixed to the frames with the drawings, it is not easy to form any definite judgment as to the efficacy of the means proposed. Air admitted beneath the windows, and after contact (we presume) with heating-tubes when necessary, appears to be the favourite method, as far as can be judged by indications on the sections, which require description to further elucidate them.

As far as the exhibition of this half of the drawings takes us, it appears that the right selection has been made, and the building, if carried out, will be an interesting and probably very useful practical experiment in regard to the economical and remunerative construction, in London, of lodgings for the poorest class.

*Names are given in some cases; where the authors have esired it, we presume.

NOTES.

IT is very satisfactory to know that the Scottish railway strike has come to an end, though but little satisfaction will be felt by some of the unfortunate strikers. Only a day or two before the collapse of the movement it was asserted by their leaders that "we win, hands down." But whatever may have been won, it has been at considerable cost,—and, it might be added, with heads down,—a number of the self-discharged employés failing to get re-instated, simply because there are now no vacancies for them. Many of them freely admit that, individually, they had no grievance whatever, and only came out to assist their comrades. It is not improbable, however, that the strike will result in a larger number of hands being engaged than formerly, in order to effect a reduction in the hours of labour where really necessary; so that the number of men permanently thrown out of employment will be comparatively small. The total loss of traffic during the six weeks' struggle has been put down at 127,634*l.*, while the strain on the funds of the Union must necessarily have been very severe, in spite of the assistance received from outside. Those of the strikers who have not been reinstated will still have to be supported by the Union for some time. It is the general opinion that the North British Company's *employés* had strong grounds for complaint, and the management have promised to consider and remedy their grievances. This Company have certainly not received a very great amount of sympathy with regard to the heavy loss sustained through the strike, though this may be partly referable to the irritation caused by their Waverley muddle, combined with the public feeling on the subject of overtime which culminated in the demand for Parliamentary interference commented upon in these columns last week. The North British shareholders had the consolation of being thanked for their support by the chairman at a special meeting last Tuesday, when Lord Tweeddale stated that the directors could have taken no other action than they did, because to have given in would have rendered railway management simply impossible.

WE have received from the National Association of Master Builders of Great Britain (W. Knox, secretary, 6, Lord-street, Liverpool) two printed documents of a statistical character relating to the building trade. The first is a "Comparative Statement" showing the hours worked per week, and the rate of wages per hour, in the various branches of the building trade in the principal towns of England, Scotland, and Wales. This cannot but prove useful for reference by architects and builders who may have to carry out works in distant towns. There are some considerable variations in the hours worked and the wages paid in different towns, the men in the smaller towns, as a rule, working for longer hours and receiving less per hour than the workmen in the larger centres of industry. The second document referred to is a "Tabular Statement of the State of Trade and the Labour Market, January 1, 1891." Several towns are marked as having made "no return," but in a very large number the return as to the state of trade is "depressed," "dull," "very dull," "quiet," "very quiet," "bad," "very bad," "slack," "very slack," and so on. Coupled with these sombre returns as to the state of trade, the reports as to the supply of labour are, in nearly every case, "abundant," "plentiful," "in excess of demand," "far beyond demand," "exceeding demand," &c. These reports, which are not altogether encouraging from the masters' point of view, will, it may be hoped, be borne duly in mind by advocates of strikes. Let us say, however, that we are not quite sure that returns indicative of the state of the trade and the labour market on January 1 afford conclusive evidence as to the average condition of the trade and the labour market taken all the year round. At any rate, we hope that things will be better two or three months hence than,—according to these returns,—they were on January 1.

THE modern tendency to look to the State for protection and assistance was well exemplified last week in the House of Commons. It was suggested that there should be a Minister of Mines. The real idea underlying this proposition was that the State should do more to safeguard the interests of miners. Again, another proposition was that a body should be added to the Board of Trade to inquire into disputes between masters and men, to obtain information, and act as arbitrators. Here, again, we have the same idea. The State is to settle the disputes between capital and labour. Such ideas, even if put into practice, must prove disappointing. Every increase in State departments increases State expenditure, and enlarges the already large body of officials. The more officials there are, the more "red-tapeism" must exist, and the less elasticity there is in the general management of affairs. As to the first of these propositions, the Home Secretary already is quite sufficiently a Minister of Mines, and as to the second, there are already plenty of people quite able and willing to arbitrate in trade disputes.

THE most important point in the newly-issued Report of the Board of the Manchester Ship Canal Company is that application will have to be made to Parliament for power to raise further capital. The directors do not state what further amount of capital is required. The announcement is, however, remarkable, since it shows that the original estimates for the work have been exceeded. If those estimates are not to be relied on, it throws doubt on the ultimate success of the enterprise. Time alone can show whether the opponents or the supporters of the scheme are in the right. But the mere fact that further Parliamentary sanction has to be obtained for the raising of more capital must be considered as disappointing.

OUR Belgian contemporary, *L'Émulation*, devotes a good deal of its attention, in the first number of its new series, to English architecture, partly in the shape of a sympathetic review of M. Paul Sédille's recent work on that subject, partly in a leading article by M. Paul Saintenoy on notes of a tour in England, with illustrative sketches. M. Saintenoy is highly flattering in his manner of speaking of our architecture, which he considers has "qualités de premier ordre et surtout le fait qu'il est d'une originale personalité au milieu du nivellement artistique qui se produit de nos jours entre les nations." He is surprised evidently that our architecture is so little known to Continental architects, and recommends them to become better acquainted with it as something worth their knowing more of than they do at present. Of the want of acquaintance with English architecture among Frenchmen we have spoken several times lately in reference to M. Planat's immense architectural encyclopædia now in progress. Perhaps other French architects might be as much surprised as M. Saintenoy if they took the trouble to come and examine for themselves, as he appears to have done.

A CORRESPONDENT calls our attention to the following advertisement which has been appearing in a well-known daily paper:—

"SURVEYORS, ENGINEERS, AND ARCHITECTS introducing work to a Road, Sewer, and General Contractor will be liberally dealt with. Communications strictly private and confidential. Advertiser well versed in the latest and most improved methods of construction."

We suppress the address at the end. The advertiser is openly inviting "surveyors, engineers, and architects" to do what, in the case of persons holding official positions, would be an act of fraud, and in the case of non-official men is in the highest degree unprofessional, and a breach of duty to their clients. Our correspondent asks if the Institution of Civil Engineers, the Surveyors' Institution, or the Institute of Architects cannot insert an advertisement under this, offering a reward for information as to any member of their respective bodies accepting the commission thus offered. We fear that is not a very practical suggestion. The only thing "surveyors engineers and architects" can do in regard to such advertisements is to let them severely alone: the practice will be dropped when it is found that nothing is to be got by it.

WHILE on the subject of advertisements we may notice another of a very different stamp, harmless enough, but we fear likely to be even more barren of result. This is one which has appeared both in the *Athenæum*

and in our own columns, in which "an experienced Academical architect" who has invented a new style of architecture seeks to associate himself with an Art-Patron to introduce and develop the said style. We presume the "art-patron" is to be a man of capital who is to erect buildings in the new style; it is not very easy to see how else it is to be "introduced." If the advertiser has really developed anything that can be called a style, and which is entirely original, it will be the first time in the history of the world that this has ever been done by one man; and if he catches a millionaire willing to spend a fortune on working a new style of architecture, the event would be, if possible, more unprecedented still.

THE Bishop of London is about to issue a commission under the Union of Benefices Act, for ratifying a union between the now united benefices of St. Mildred Bread-street and St. Margaret Moses; and the now united benefices of St. James, Garlick-hythe, Holy Trinity the Less, Garlick-hill, and St. Michael, Queen-hythe. We are informed that under the scheme it is contemplated to demolish the church of St. Mildred, which was similarly threatened about ten years ago, and to constitute St. James as the mother church for the five parishes. Both these churches are the work of Wren. The latter is marked by a large bracket-clock, surmounted with a carved figure holding a staff, possibly intended for St. James the Great; and a tower, with steeple, rising to about 125 feet, both of which in section and elevation closely resemble those, also by Wren, of the neighbouring St. Michael, Paternoster Royal, and St. Stephen, Walbrook. In the *Times* of December 27, 1889, will be found a letter written by Mr. Francis Chambers, architect, to say that some forty years since he had superintended the sealing up, with a three-foot crust of concrete, of the soil beneath this church. Mr. Chambers describes the remarkable state of preservation in which the bodies were found, and thinks it is due to the sandy soil, almost black in colour, which had pulverised the coffins. He adds that some human remains underneath St. Mary-le-Bow, Cheapside, were found, about the same time, to be in a similar condition. St. James's was repaired in 1838, and completely restored in 1877, when it was fitted with the oaken pulpit and choir-stalls (attributed to Grinling Gibbons) from St. Michael, Queen-hythe. The organ, by Father Smith (1697), was rebuilt, in 1866, by Messrs. Gray & Davison. Bishop Hooper, burnt at Gloucester, and John Rogers, the Martyr, were rectors here.* The fabric cost 5,357*l.* 12*s.* 10*d.* This is the church, formerly dedicated to Sts. James and John, wherein Steele heard "the service read [by the rector, Mr. Philip Stubbs] so distinctly, so emphatically, and so fervently, that it was next to an impossibility to be inattentive" ("The Spectator," Aug. 18, 1711). The vane, in form of a ship, and large enough to hold a bushel of corn, which capped the small, but beautiful, spire of St. Michael, Queen-hythe, has been fixed above a spirelet at the new rectory-house (for St. James's) in Upper Thames-street, erected on its site, at back whereof, facing Hugginlane, remains the churchyard. It alludes to the local traffic in grain at Queen-hythe. A stone in the Guildhall Museum records the burning of the church in 1666, and its rebuilding ten years later, for the then united parishes of St. Michael and Holy Trinity the Less.

ST. MILDRED, Bread-street, of which only the west end, of stone, can now be seen from the street, is dedicated to Mildred, who was buried, *circa* 750, in the abbey founded by Domneva at Minster, in Thanet, and which afterwards was called by her name.† Lord Trenchaunt, of St. Albans, rebuilt it *circa* 1300. It was again rebuilt, and mainly of brick, in 1677-83, at a cost of 3,705*l.* 13*s.* 6*d.* The tower, against the south-eastern corner, which is 18 ft. square at base, bears one of Wren's characteristic wooden spires covered with lead. On the cornice and blocking-course stands a leaden roof, of pyramidical shape, upon this a square lantern, and above that a slender spire, also square on plan, carrying a vane—the whole rising to 140 ft. The interior is greatly admired. Four arches support a highly-enriched hemispherical cupola or dome, constructed within the external roof by slight deal ribs attached to the principal timbers.

> "The roof itself is of an ordinary 'tie-beam and king-post' construction, but in that part which occurs immediately over the cupola, the tie-beam, instead of being attached to the foot of each principal rafter, as usual, is raised about half way up, in order to admit the rise of the cupola; and diagonal braces from rafter to rafter are introduced. The architectural student may derive advantage from an examination of it."*

Here, too, is some fine carving on pulpit and sounding-board, the supposed work of either Gibbons or his pupils. The church measures 62 ft. by 36 ft., the height is 40 ft. A tablet commemorates some members of the Crisp family, parishioners, of whom Sir Nicholas Crisp, the friend of Charles I., is said to have introduced into this country a new system of brick-making. After the destruction by the Great Fire of the Church of St. Margaret Moses, or, rather, Moyses, in Friday-street, its parish was united to St. Mildred.

WE have received the first number of *Physique*, a journal of Physical Education to be published monthly, the object of which will be to provide a high-class journal which will deal with physical education in all its aspects, from nursery and Kindergarten games to field sports, with questions of personal hygiene, &c. The subjects belonging especially to what is called Sanitation, such as drainage, water supply, &c., are not to be included, as it is considered they are already sufficiently dealt with by other journals. From the first article on "National Physique," by Mr. C. Roberts, F.R.C.S., we take the following quotation, in reference to the action of the London County Council and other bodies with regard to overcrowding:—

> "It is well to temper zeal with discretion, and a looker-on who is in entire sympathy with all these agencies but not identified with their work may detect flaws in it which escape the notice of the workers themselves. In its haste to secure open spaces the County Council, for instance, shows a lack of proportion and an ignorance of the requirements of the whole county of London, with its area of 77,400 acres, its 4,282,921 inhabitants, and its 486,056 inhabited houses. A few weeks ago the Council agreed to give 200*l.* an acre for a pine-wood situated on the extreme south-east boundary of the county at Plumstead, in a district which possesses only one house and six persons to the acre, and which is contiguous to a common already in possession of the Council, and with the whole county of Kent behind it; and now it proposes to spend 20,000*l.* an acre on an overcrowded area in Bethnal Green which possesses forty-nine houses and 373 persons to the acre—not to provide an open space where one is most wanted, but to raise piles of so-called model dwellings which will eventually be occupied by a larger number of persons than exist on the ground at present. Thus we find the Council purchasing land at a considerable cost for an open space which is not wanted and which might well be used to relieve overcrowding in other parts of the county, and clearing away small houses in an already too-crowded district to supply their places by still larger houses. Overcrowding cannot be remedied by any jugglery with bricks and mortar. To put one house on the top of another is to increase all evils of over-crowding, and nothing short of a serious centrifugal dispersion of the people will be of real use in overcoming them."

THE Natural Science Museum of the University of Cambridge has had a narrow escape from destruction by fire. But for the fortunate circumstance that the outbreak occurred in the daytime, and so gave the officials on the spot a chance to extinguish the flames before they had reached any of the dangerously-inflammable spirit preparations, nothing could have saved the building, or group of buildings, with their valuable contents. The fire was put out so promptly that its exact cause is clear, and is one interesting to notice. A gallery had lately been added to one of the rooms, carried by wooden cantilevers; the inner end of one got alight, and, blazing out, set the gallery on fire. The mischief was caused by the flue from a heating-furnace, too near which (as it proved) the cantilever had been inserted, although the position of the flue was known, and sufficient precaution, it was thought, had been used by inserting the beam 6 in. to one side of it. In doing so, however, a brick or two had been knocked out of the side of the flue, thus opening a passage through which the timber became ignited, although the heating-furnace, it is worth while noting, was 40 ft. below. This incident should serve to enforce the necessity of keeping at least 9 in. of sound brickwork round every flue liable to become much heated, until it has passed clear above the roof.

AS our readers are aware, the Architectural Association has attempted, in remodelling its by-laws, to please all parties and obtain the necessary funds for its more extended action, by raising the annual subscription to a guinea for new members, and leaving old members undisturbed in their present half-guinea subscription. This most illogical and unfair arrangement, which puts the burden of increased expenditure on young incoming members, and takes it off the shoulders of the older members who have mostly made their way in the world and have more guineas to spare, seems to have been carried purely on account of the scare that has been raised that there would be an extensive resignation of old members if the subscription were raised. We have said all along that we did not believe this, and that the few members who would resign to save half a guinea a year were probably not worth retaining. The result seems likely to entirely justify our remarks. The "A. A. Notes" of January contained a generously expressed letter from Mr. W. Millard, which escaped our notice at the time, protesting against the invidious position in which the existing members were thus placed, and proposing that all who thought with him should voluntarily subscribe a guinea in future. This has drawn an equally hearty support in a letter from Mr. E. J. May in the February number of the "Notes," expressing a hope that a long list of old members will follow the course suggested by Mr. Millard. We hope so too. The Editor of this journal, who is an old member, intends to do so, and if a large number of other old members join in carrying out Mr. Millard's suggestion it will be the best possible answer to the scare that was got up about a large secession of members taking place if the subscription were raised: a scare which we always believed to be almost entirely groundless.

HOUSING OF THE WORKING CLASSES.—At the meeting of the Paddington Vestry on the 3rd inst., a memorial was presented from thirty-seven of the representatives recently appointed by the Metropolitan Vestries and District Boards to the recent conference convened by the London County Council for the purpose of considering the Housing of the Working Classes Act. The memorial, after expressing regret at the premature closing of the conference referred to, expressed the opinion that it was desirable the conference should be called together again, and asked the Paddington Vestry to take the initiative to this end. The Vestry passed the following resolution:—"That the request contained in the memorial be complied with; that the representatives appointed by this Vestry to attend the late conference be re-appointed; that the Clerk do issue invitations to the several Metropolitan Vestries and District Boards, also to the London County Council, the Common Council of the City, and the Commission of Sewers, asking them to appoint representatives, and to depute the Medical Officers of Health and the Vestry and Board Clerks to attend a meeting of the conference at the Paddington Vestry-hall, on Friday, February 20, at three o'clock in the afternoon." Invitations have been issued accordingly.

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* See Mackeson's "Guide."

† St. Mildred, Poultry, the reputed burial-place of Thomas Tusser, was pulled down in 1872. Mr. L. Ffytche, of Thorpe Hall, near Louth, bought the stones for the building of a chapel there.

* George Godwin's "Churches of London," vol. ii. (1839).

LETTER FROM PARIS.

THE Siberian weather we have been experiencing lately has led, among other results, to a great outbreak of charitable relief in France, both in rural neighbourhoods and cities. At Paris the organisation of relief has been very large and very intelligently carried out, and existing buildings such as gymnasia, meeting-rooms, unoccupied houses, &c., as well as the Champ de Mars buildings, have been utilised as refuges from the cold, the Palais des Arts Libéraux especially having been warmed and made into a vast dormitory. To those who knew this building during the height of the Exhibition time, the contrast of seeing it in its recent aspect, the floors spread with mattresses occupied by figures in every stage of poverty and wretchedness, was pathetic enough.

Unfortunately another effect of the cold weather has been to close the building yards. Among the works thus interrupted is the "Funiculaire" or rope-railway at Belleville, which ought to have been opened at the end of autumn, but will not be ready for two or three months now. Whether it is with the object of finding work for building artisans or from other and more æsthetic motives, several Deputies have raised a proposition for building a great legislative palace on the former site of the Tuileries, in which the Sénat and the Chambre des Députés are each to have a great hall with a "salle des pas perdus" common to both between them. The objections to the project, æsthetic, financial, and political, seem however too strong to be easily overcome. No doubt the Palace of Beputies is badly planned and arranged, and the public have cause to complain of it as well as the deputies, but its present defects might be easily remedied, and M. Joly, Architect to the Chamber, has prepared a plan which will render the building at any rate more convenient for the moment, without any extravagant outlay. Public opinion is in general adverse to the proposed Tuileries plan, not considering the requirements of Parliament a sufficient reason for such a large and costly operation which would crowd and spoil a fine open space. Another fancy of the moment is to suppress the obelisk of the Place de la Concorde and substitute a monument to Victor Hugo, an idea which meets with still less sympathy, and which would destroy the association with a site and a monument that have become almost a national property.

Unfortunately Parliament is little careful about preserving the treasures of Paris, and the small budget set apart for that object is badly laid out. A great part of the Louvre Museum, for instance, is not warmed, and consequently is useless to artists in winter; and the works for the restoration of part of the exterior have been stopped merely for want of any available funds; the Salle des États is in a lamentable state; the arrangement of the Museum of Algerian and Tunisian Antiquities has been suspended; and the objects for the present left in their cases. The Ministerial department concerned with these things is full of good intentions, but has no funds and nowhere to turn for them. In the meantime buildings are decaying, and irreparable mischief being done which might be prevented if taken in time. The ruins of the Cours de Compte still stand as they have stood for twenty years. It seems to be forgotten that there is what might be called a passive vandalism as well as an active vandalism, and that the one may have as bad effects as the other.

The small exhibition of the Cercle of the Rue Volney is very good this year. Among the works in it are two fine portraits of M. Cernuschi and M. Bœswilwald, by M. Bonnat; that of M. Constans, Minister of the Interior, by M. F. Flameng, a fine head of an old man by M. Henner, a Brétonne girl by M. Brispot, a Diana by M. Elie Delaunay, and the "Annunciation" by M. Olivier Merson, with a landscape bathed in a mystic light. The rival club, that of the "Union Artistique," has also just opened its gallery. Mention of that and the water-colour exhibition is deferred for another occasion.

While these minor exhibitions are going on, the committees of the two *Salons* are organising their respective exhibitions. At the Champ de Mars this year there will be a fourth large gallery of paintings instead of the small rooms which were pressed into the service last year, and the central hall will be arranged for the reception of sculpture, of which there will be more this year than last. It is expected that there will be some kind of effort to render the Palais d'Industrie more attractive this year; among other schemes it is suggested that there should be a "salle d'honneur" in which all the principal pictures should be collected: there is also talk of arranging "salons de repos" with lounges, &c., and hung with fine tapestries. In fact, the Société des Artistes Français seems disposed to make every effort to surpass all its former attractions. The number of works exhibited is to be limited to 1,800, a change which the public on the whole will probably appreciate. In regard to the honours, it is decided that the médaille d'honneur will be awarded by the votes of an absolute majority of the artists who have received the other honours. The number of medals to be awarded is restricted to forty.

The Louvre has received an important legacy from M. Paul Rattier, including a fine picture of the early Flemish school, somewhat in the manner of Quentin Matsys, as well as a Renaissance bas-relief and a medallion of the same date attributed to Benvenuto Cellini. The President of the Republic has also presented to the Museum his bust by M. Chapu.

It may be remembered that in consequence of the disorderly proceedings of the students M. Bonnat's atelier was closed for five months. The Minister of Public Instruction has reduced the term to three weeks, and the atelier has now opened its doors again, under new regulations which it is hoped will prevent any recurrence of these discreditable scenes.

M. Charles Garnier, it is reported, has been appointed consulting architect of the Church of the Sacré Cœur at Montmartre. If this is officially confirmed, M. Rauline will nevertheless retain the immediate and practical direction of the works. The sum which has now been spent on this church amounts to 24 million francs, of which 4 millions have been given by some generous donors, and the remaining 20 millions have been raised by subscription. 1,500,000 francs have thus been raised annually for this building.

The death of Meissonier is of course the most absorbing event in the artistic world this month. He died on Saturday, January 31, at 8 o'clock in the morning, death being the result of pneumonia. He was 80 years of age, and had been working up to the very moment of the commencement of his illness. Last year he exhibited at the Champ de Mars Salon his picture of "Octobre, 1806," which was the great success of that exhibition founded by himself, and he has left many half-finished pictures on his easel.

This remarkable artist, whose personality was as marked and original as his paintings, made himself, unfortunately, many enemies. His nature was naturally irritable, and he seldom had an amiable word for any one. But if one could feel little enthusiasm for his character, one must recognise in him, as a painter, a master comparable to Ingres and Delacroix. He possessed the highest qualities of an artist: power of drawing, of colour, of touch, and admirable perfection of finish. He was no specialist in his art nor was he confined to any particular line of subject; he illustrated the eighteenth century, the Revolution, the Empire, and the present time. He treated interior and open-air scenes with equal power; no one knew better how to group his personages, to give spirit and vigour to military, no one has better revived for us the Napoleonic epic, which he has represented at its three great epochs, 1805, 1807, and 1814. This latter picture especially, showing the Emperor on horseback, pale and as if crushed under the weight of adversity, leaves an impression of grandeur and melancholy which one cannot forget. This picture was recently bought by M. Chauchard for 850,000 francs.

Jean Louis Ernest Meissonier was born at Lyons on February 21 1811. His early days were marked by poverty and a painful struggle for the means of existence. He eventually entered the atelier of Léon Cogniet, but did not remain there more than four months, and after a short tour in Switzerland and a visit to Rome, he exhibited, in 1834, "La Visite chez le Bourgmestre," which subsequently formed part of the late Sir Richard Wallace's collection.

Among his best known and most successful works may be named "L'Amateur d'Estampes," "Le Fumeur," "L'Incroyable" (which made such a success in the Salon of 1858 and was purchased by the Baron de Rothschild), "Le Graveur," "La Lecture chez Diderot," "General Desaix à l'Armée du Rhin," "Confidence," "L'Attente," "L'Amateur des Tableaux," "Un Peintre des Enseignes," "Moreau avant Hohenlinden," "Les Joueurs de Boules," "Le Guide à l'Armée du Rhin," "Jéna," "Le Voyageur," &c. Nor must we forget one of the most able and popular of all, "La Rixe," which was purchased by Napoleon III. and presented to the Prince Consort of England. The "Bataille de Solferino," now in the Luxembourg, is another masterpiece, which was injured eighteen years ago by some person unknown, who crushed in the head of the Emperor with the point of a walking-stick; the head was subsequently repainted by the artist.

Meissonier had during his life enjoyed all the honours to which an artist could aspire. He had three times received the Médaille d'Honneur at the Salon, and on each occasion received a new dignity in the Legion of Honour, receiving the Grand Cross in 1889. He had succeeded Abel de Pujol at the Académie des Beaux-Arts in 1861. Delacroix said of him that he was incontestably the master painter of this epoch, a judgment which his contemporaries have ratified; and his death creates a void in French art which it is impossible to fill up.

The day before Meissonier's death took place the funeral of Charles Chaplin, the painter, who was born in 1825 at Andelys, but of English parents. Later in life he was nationalised as a French subject. He was a pupil of Drolling, and his true path of success was found with the three portraits which gained him the second medal of the Salon in 1851, when he abandoned his first manner and became a kind of modern imitator of Boucher and Fragonard. His early pictures were the "Pâtre du Cevennes" and "Plaine du Cantal"; then he found some success in mythological figure subjects, and his decorative paintings in the apartments of the Empress Eugénie were remarkable works of their kind. He also excelled as an etcher and lithographer. There is a very powerful engraving by him after the "Noce Juive" of Delacroix.

The other artists who have disappeared during this very fatal month are Delaplanche, Charles Gauthier, and Aimé Millet. It would occupy undue space to retrace the important part played in modern French sculpture by these eminent artists. Delaplanche was a pupil of Duret, Gauthier of Jouffroy, and Millet had studied under David d'Angers. They were all hard workers and enthusiasts in their art. Gauthier was eminently conscientious both as an artist and as a teacher, and his instruction was much sought after at the École des Beaux-Arts.

We have also to record the death, at the age of 72, of M. Laisné, Diocesan Architect and member of the Commission des Monuments Historiques, and a former professor at the École des Beaux-Arts. M. Laisné occupied a considerable place in French architecture in his day; he was architect of the Lycée Janson at Sailly, the École Supérieure de Pharmacie, the Lycées of Cognac and Gueret, and carried out important restorations at the Cathedral of Sens, at Nôtre Dame at Dijon, at the École Supérieure of Cluny, &c. He was also eminent and much looked up to as a teacher at the École, and is much regretted as an able architect and a kind-hearted man.

BYZANTINE ARCHITECTURE.*

BY PROFESSOR AITCHISON.

EVEN if we had not some of the important buildings erected in the time of Constantine, we could form a shrewd guess of what they were like, for we roughly know what there was in Rome up to his time, and he began to reign but eight years (313) after the abdication of Diocletian (305), for we may call him reigning after the defeat of Maxentius in 313, and when he issued the edict giving liberty of public worship to the Christians. Diocletian's Palace at Spalato, and his Baths at Rome still remain, and Constantine's architects could only have altered a little, or improved a little, on what had immediately preceded them. We are also told that at Constantinople Constantine had palaces built like those in Rome and its vicinity to induce the Roman nobility to come and stay there. We know that he gave one of the private basilicas at Rome for the Church of San John Lateran, and that he had the original basilica of St. Peter's built. Vitruvius tells us what the basilica was like (Vit, Lib. V., cap. i., par. 4),

* Being the Second Royal Academy Lecture on Architecture this season. Delivered on Thursday evening January 29, 1891. For first lecture see p. 82, *ante*.

and that the private basilica was like it (Vit., Lib. VI., cap. v., par. 2); he began to write when the Republic still nominally existed, and important decisions had to be given by able Senators on what we should now call international questions. The private basilicas were then arbitration-rooms, where numerous deputations probably had to be seated, crowds of witnesses, and possibly many assessors, and they were also used for political meetings, but in Constantine's time I fancy they were a sort of music-hall. The Lateran Basilica was originally built by Lateranus, a senator of Nero's days. Besides the basilicas Constantine turned into churches or had built, he had other churches constructed after the fashion of the Circular Temple of Portunus at Ostia, and it is believed others of an octagonal shape, after the manner of the Golden Temple of Antioch. We also know that most of his buildings at Constantinople were roofed with wood, and so badly built that when they were not burnt they fell, or had to be pulled down; that he was so short of architects, that he granted immunities to those who would allow their sons to be brought up to that profession, and bestowed a salary on the students, and the edict for this applied to Italy and a great part of Northern Africa. The prevalence of building in his new capital, and in several parts of the empire, must have given, too, a great impetus to the immigration of architects into Constantinople, as well as into other cities where large building operations were being carried on.

We also know that the art of figure sculpture was at so low an ebb that statues from existing buildings were transferred to his triumphal arch in Rome, because there were no sculptors capable of doing them. We believe that there was not much change in the forms of churches for more than a century after his death, although the bema or sanctuary was made much deeper, and, perhaps, also the form of the Greek cross or the Tau was more insisted on, though it is stated that some of the civil basilicas at Rome had a transept in front of the apse which gives the Tau; this form is seen at the basilicas of St. Paul, outside the wall, and St. Mary the Greater at Rome. The present church of St. Demetrius, at Salonica, is said to have been built in 412-413. The Tau is made in this basilica by two enclosures in the aisles, just in front of the apse and at a higher level,—*i.e.*, at the level of the paving of the bema, which was always raised a step. The semi-circular atrium to St. Demetrius' tomb is domed after the fashion of the Temple of Jupiter at Diocletian's Palace, only here it was made ornamental, and evidently was meant to be seen, apparently pointing to a later date. Still an important step had been taken in regard to capitals, for there are some at St. Demetrius which we now look on as purely Byzantine. It is not, however, until we come to the reign of Justinian that we have any exact dates to rely on after the date of Constantine. Although archæology is not of any direct use to architecture, except where it is all the architecture there is, it is of the utmost importance that we should know the dates of buildings when we want to trace their influence on the plan, the construction, or the ornamentation of subsequent ones. Procopius has given us a list of some of the buildings erected by Justinian's order to within ten years of his death, and this includes St. Sergius and Bacchus at Constantinople (see lithograph), called "the little Sta. Sophia," whose interior is very similar to San Vitale at Ravenna. At first sight, the upper parts of the three flat sides of the octagon are scarcely noticed to be different from the apses. San Vitale is believed to have been begun the year before Justinian was associated with his uncle Justin as joint Emperor, and that when he was sole Emperor he and Theodora contributed funds for its completion; it is also said to have been designed on the plan of Constantine's Golden Temple at Antioch. I must tell you that the history of Byzantine architecture is in a perfect state of chaos as far as dates are concerned, and when we have exhausted Procopius' list of the buildings we can only make guesses at the dates of churches from this arrangement, construction, or ornamentation.

A list of the buildings erected by Constantine's order is given, I believe, by Eusebius, and in Ciampini are illustrations of the ecclesiastical buildings erected in his reign. Our Archæological School at Athens is now mainly devoting itself to the study of Byzantine architecture; its students, Messrs. Schultz and Barnsley, have for some time past been making drawings of the remaining Byzantine churches in Athens, Epirus, Macedonia, &c., including their mosaics; and Mr. Gardiner, the head of the school, has been assisting them in the deciphering of inscriptions. The school has been kind enough to lend me some of their beautiful and accurate drawings, which are now exhibited. It depends upon the interest the public takes in the subject as to how many of the drawings, how much of the subject, shall be published, and whether the study of it shall proceed or be abandoned, so I hope my hearers will give all the encouragement they can to this undertaking. Roman remains up to the days of Constantine have been fairly represented, but those from the dedication of Constantinople in 330 until the taking of Constantinople by the Turks in 1453, have hitherto been but meagrely represented, and no serious attempt has been made to obtain the dates of the existing buildings.

In the early Christian church the question was, where it could get a place to meet in without molestation, and we know that the catacombs at Rome were used for that purpose, and there was no thought then about orientation. As late as St. Augustine, who was born in the fourth and died in the fifth century, all that he asked for was a square room like the Ark of Noah, with a recess for the altar,; but as early as Clement, at the end of the first century, the new churches were arranged, when they could be, like the temples are recommended to be by Vitruvius, with the entrance to the east. St. John Lateran and St. Peter's are so placed; the priest at the altar stood facing the congregation, and the women were put in the aisle to the left of the priest, or north side, and the men to the right, or south side. When the orientation was changed in the fifth century, and the altar was at the east end, the priest turned his back on the congregation, and though his hands were the same way as before, the right and left of the altar remained in their original position. This has introduced great confusion. S. Apollinare Nuovo, at Ravenna, is oriented with its front to the west and the altar to the east; but it is evident that the women were on the south side, and the men on the north, for their attention must have been directed to the examples of their own sex, and the procession of virgins is on the north and that of the saints on the south side of the nave, —*i.e.*, to the old right and left of the altar. The ambos were retained in the old places after the change of orientation, the Gospels being read from the left, or north ambo, and the Epistles from the right, or south. I should here say that the clergy had usurped the nave for its own use, and the congregation were left in the aisles, the nave being fenced off by a low balustrade; where Christian churches have been converted into mosques these balustrades are often found used for paving. Besides these arrangements, there was an atrium in front of the church with an impluvium, a labrum, a fountain, or a well in the middle for ablution, and a narthex at the entrance of the church for catechumens and penitents.

As the population gradually became Christian, the atrium, which was partly used for sheltering candidates for baptism and partly for ablution, was only needed for the second purpose, and began to fall into disuse; and when, in the seventh century, it was found that the Moslem faith prescribed ablution, it was given up altogether in the Christian Church. Extreme personal uncleanness then became almost synonymous with sanctity,—it showed, at least, the Christian's repuguance to this injunction of the Koran. We read of monks who were so holy that they had never been washed all over since they were baptised. The holy water stoup in Roman churches is said to be a relic of pristine ablution. In the early churches the baptistery was a separate building, outside the church; but eventually adult baptism was given up, and the font was admitted into the church. The altar originally stood just in front of the apse, and the apse itself was used for the clergy, and was called the Presbytery, with a seat all round it called the consistorium, and with a higher seat in the middle for the bishop; this arrangement may still be seen at St. Fosca, at Torcello, near Venice, and I believe is still used in the Orthodox or Greek Church. In the Orthodox church the altar was, and is still, merely a table with a crucifix on it; but in the Papal or Western Church, it became the martyrium, and was erected over the sarcophagus of a saint, or over the grave where his remains, bones, or fragments were buried. Eventually each aisle was consecrated as a separate church, and each had a little apse at the east end. The Basilica of San Pietro ad Vincula at Rome, said to have been built in 442, is, I believe, the first church in which this feature is seen, but I fancy if it were examined it would be found to be a much later alteration. The use of three apses became, and is now, universal in the Orthodox Church, but it does not exist at Sta. Sophia, at Constantinople, built in 532. It is, perhaps, not to be looked for in circular and octagonal churches, but it does not exist in the Basilica of San Demetrius at Salonica, though at the east end of its north aisle there is a little chapel with the three apses (which I could not get into), and there is only one little apse at the east end of the north aisle, besides the great central apse at the Great St. Mary's, now called Eski Djouma, at Salonica,—possibly a later addition; nor does this feature occur at St. Irene, St. John Studios, nor at the Kalender Mosque at Constantinople, so that if we are quite sure these small apses,—the French call them absidioles,—have not been added subsequently, it gives us some idea of the date of the church. The church at Dana, on the Euphrates, said to be built in Justinian's time, has only one, and not three apses, although it has a nave and two aisles.

It is, perhaps, as well to say here that Christian churches, after Constantine's edict, possessed the right of sanctuary, and I was told by a member of the Orthodox Church that the iconostasis was adopted for this reason,—that robbers, thieves, and murderers, when pursued, were accustomed to rush into a church and cling to the altar. To prevent this abuse the altar was protected by the screen and doors, called the iconostasis, so that sanctuary could not be obtained until the priest was satisfied that the claimant deserved the privilege.

The apse was originally without light, and was only lit from the nave or transepts. Justinian unfortunately had a dream that at Sta. Sophia it was to have three windows, though before his time windows had been put in the apses.

Since the Marquis de Vogüé published his work on Central Syria, great attention has been given to the buildings he found there, and to their influence on Eastern and Western architecture. These buildings of Central Syria, whether lay or ecclesiastical, were of stone, and most of their floors and ceilings were formed of stone slabs carried by arches, the roofs being mainly of concrete, though there are the ruins of churches that once had timber roofs; in short, we may say that where forests were at hand the architects used timber; but where no timber was to be had they made shift with stone, just as at Babylon they used burnt brick.

The Pretorium at Mousmieh is supposed to have been one type for early churches. This building consists of an open portico in front, with a nearly square chamber behind it, divided into a wide central nave and two narrow aisles. The nave is formed by four detached and four attached columns, each aisle by four attached columns, and those of one side of the nave; the central square of the nave is formed by arches resting on the four detached columns, and has over it a four-sided groined dome, of which only fragments remain. The base of this dome was abutted by four semi-circular vaults. Beyond the end of the central nave is an apse, and a small, square chamber at the end of each aisle. This building is said to have been erected between 161 and 169, in the days of Marcus Aurelius and Lucius Verus, and is consequently Roman. A great number of Christian churches have also been found, but there is very little external evidence to show their date. One little chapel at Omm-es-Zeitoun, built in the year 282,—*i.e.*, before the days of Constantine,—was domed on a square plan, but the circle is obtained from the square by corbelling at the angles, and not by pendentives.

It is worth noticing that though the Roman Empire, after the loss of the western part, extended over the exarchate of Ravenna, Asia Minor, Syria, Palestine, Egypt, and a part of the north littoral of Africa, till the invasion of Syria by the Moslems in the reign of Heraclius (634 A.D.), yet there seems to have been no uniformity of style or method of building. Special local schools seem to have existed, that produced special forms of churches, partly influenced by the materials at hand, and partly by the existing types. In 515 or 516, the baptistery of St. George at Ezra was built, an

oblong-square building, consisting of two concentric octagons, with two vestries and an apse, wholly built of squared stone, the inner octagon being domed over in rubble with an oviform dome, circular on plan like the Persian domes; a very similar baptistery, cathedral, or church is found at Bozrah, in the Hauran, said to be of the year 512, or preceding that of St. George of Ezra, only circular instead of octagonal in plan. Some believe that the baptisteries or churches of this shape were built after the fashion of the Holy Sepulchre at Jerusalem. This was built by the orders of Constantine in 326, and was destroyed by Chosroes II., the king of Persia, in 614, some twenty years before the Arab invasion. The controversies on the shape and position of the Holy Sepulchre still continue, so I will leave the subject alone.

I may say that most of the Syrian churches had but one apse, and mostly two square chambers on each side like those at the Prætorium at Mousmieh, and that the basilica at Behio (Central Syria) has a square apse. These Syrian buildings from 330 to 635 are technically Byzantine, but have not much resemblance to those built elsewhere.

We must believe that the numerous schools of architecture started by Constantine had great influence on architecture, and must have made the architects more scientific; we must also recollect that there had been a greater and greater inclination at Rome to make public buildings uninflammable by vaulting and doming. The baths had all their halls or chambers vaulted or domed, and the basilica of Maxentius finished by Constantine was wholly vaulted and domed. We also know that building gradually became more scientific, for there was a gradual diminution in the ratio of the supports to the total area, for while the ratio of Caracalla's baths is ·176, that of Diocletian's is ·167, and the Basilica of Maxentius ·127. Still, if we are to believe Œlius Spartianus, who lived about 297, in the days of Maximinianus and Constantius the Green, the architects had in certain respects fallen off in skill, for he says they confessed they were unable to rival the solar cell of Caracalla's Baths. I mention this prevalence of incombustible structures at Rome because so many of Constantine's buildings at Constantinople appear to have been roofed with wood, and the only reason that can be assigned for this is his haste and the want of skilled architects. Two processes seem to have been going on between the time of Constantine's brief (334 A.D.) for starting architectural schools, and the accession of Justinian in 527 A.D., namely, the Church seems to have been settling the best form of building for its ritual while the architects were perfecting themselves in domical construction and its abutments, and they were learning how much piers of brick and stone and monolithic columns of marble would carry. The octagonal church at San Vitale at Ravenna is said to have been founded by Ecclesius in 526, the year Theodoric the Great died, and consecrated by Maximianus, the Archbishop of Ravenna, in 547, eight years after the taking of Ravenna by Belisarius; the Emperor Justinian and Theodora are said to have been at its opening; it is very similar in plan to Minerva Medica at Rome, but it is said to have been built after the model of Constantine's Golden Temple at Antioch. It consisted of an oblong narthex, two storeys high, flanked by two round towers containing staircases; for the long narthex set askew, and now I believe pulled down, is said to have been modern. The church is an octagon about 118 ft. across. Inside the external octagon is another concentric to it which supports the dome, about 50 ft. in diameter, with seven of the sides of the octagon formed into semi-circular apses, two storeys high, and each supported by a triple arcade with two columns on each storey. The seven openings have semi-circular arches at the level of the roof of the gallery, the eighth side forms the sanctuary with a projecting apse at its end, the triumphal or sanctuary arch rises to the height of the arches over the apses, and on either side of the sanctuary are two staircases, and beyond them two circular vestries or chapels. The space between the outer and inner octagons form the aisles, and over these are galleries—one side at least was originally meant for the women, if not both. The octagon sides run up and are brought into the circle by small pendentives, from which a hemispherical dome rises, roofed outside with a hipped timber roof; the bottom of the dome is pierced with eight two-light windows. The arch to the sanctuary runs up the two storys, and just above it the sanctuary roof is groined as far as the apse, which is domed over at a height that will allow of a window over it. The parts to the north and south, between the arch and the apse, have three-light openings in two storeys on each side. The aisles have barrelled vaults, into which the openings of the outer windows and the arches of the seven apses groin. The walls of the aisles are cased with marble in panels; these panels are streaked in red and white, and believed by Mr. Brindley to be Rosso Antico, and are formed of slabs in two or four pieces so as to make a pattern.

On the sides of the triumphal or sanctuary arches are fine Classic bas-reliefs of Cupids, one with a trident (engraved on plate 148 of Moses Vases, 4to, London, 1814), and are said to have been taken from a temple of Neptune, for San Vitale is said to have been built on the site of a temple to that god. There are green porphyry pilasters imbedded amongst the marble linings of the lower aisles, and a superb circular piece of opus Alexandrinum of red porphyry inlaid with mother-o'-pearl, giallo antico, and fine stones of red, green, and blue. The whole of the sanctuary is covered with superb mosaic; two panels at the back of the altar represent, on the right, Justinian with his guards and officers; and on the left side, Theodora about entering the Church of San Vitale. She is sumptuously dressed, and has a robe of the Imperial purple embroidered in gold at the bottom as a border, with the adoration of the Magi. The groined vault over the altar has the most beautiful ornamental mosaic I have ever seen. All the columns have carved blocks over their capitals. Many of the caps are Byzantine; the upper blocks are in some cases carved with a cross and two lambs. Procopius tells us that the churches of SS. Sergius and Bacchus, at Constantinople, were built by Justinian. One was basilica shaped, and has been destroyed, the other consists of an open Turkish porch, a narthex, and the church with a projecting apse. The church itself is an irregular oblong square on the skew, about 95 ft. by 112 ft. with the narthex; it has an octagonal centre; the outer oblong square is made into an irregular octagon by four large niches in the angles, the seven sides of the inner octagon are treated as follows:—The side opposite the entrance has a triple opening with two columns, and this is repeated on the two other square sides, the diagonal sides have semi-circular apses, also supported by two columns, and the whole of the ground-floor has an entablature. The eighth side is occupied by the sanctuary, with a semi-circular apse at the end, the arch of which goes up to the springing of the dome. The first-floor over the aisles is much higher than the ground story, and is treated in the same way, only the triple openings are arcaded, and seven semi-circular arches rising from the level of the caps of the columns connect the whole. Between these arches are the spherical pendentives, supporting a semi-circular dome, fluted with sixteen flutes; each flute dies against the vertical wall, and in each alternate arch so formed is a single window. The upper gallery goes over the narthex. The entablature, which is of marble, has an enriched architrave. The frieze is divided in two, the lower part being a torus with fillets, ornamented with the Byzantine acanthus scroll, and a flat surface above with a Greek inscription.

The cornice has an ornamented cyma without a fillet below; the corona is replaced by cantilevers; below them is an ornamented bead with a dentil band and fillet below. Eight of the columns are of Verde antique, the rest appear to be synnadic; the capitals are Byzantine, those of the upper galleries are of the splayed cubic shape enriched with ornament and with a sort of dwarf Ionic capital below them. The joints of the columns between the bases and caps are filled with lead. It is a very striking church as far as its internal design is concerned, but it is at present whitewashed; it is hoped the mosaic exists below the whitewash. The dome is a hemisphere about 54 ft. in diameter.

We must probably look to Asia Minor to find where Anthemius and Isodore made their maiden essays; for when Justinian first decided on the new Sta. Sophia, Anthemius seems to have had no hesitation in making his model; and, though Procopius tells us that he and Isodore met with great difficulties from the unprecedented weights to be carried, they successfully completed the building; and this, as far as we now know, was the first great European building with spherical pendentives, the original dome, too, being the flattest ever built (see lithograph). Architects will admit that less than forty days was not much time for making a model of an original building with one of the largest and flattest domes ever built. I beg to draw your attention to a model being the oldest and best way of showing a design. It was from a model that Sta. Maria-dei-Miracoli at Venice was built, and Sir Christopher Wren recommends a model to be made for all important buildings.

The buildings forming the church of Sta. Sophia and its dependencies were as follows:—An open atrium, surrounded on its three sides by a peristyle, and having in the middle of its open area a cistern or fountain, an exo-narthex, a narthex preceding the church, the church, and a passage at the back of it; on the south side a range of buildings, and attached to these, at the west end, but further south, the baptistery. (O).

The buildings on the south side, beginning at the west end, were as follows:—A staircase for the superior catechumens (P), the vestibule to the narthex (I), a passage and court (J), the clock-room (K), the holy well (L), the metatorion or large hall (M), the triclinum Thomäites (N), and a wooden staircase for the superior catechumens (13), forming a communication between the galleries of Sta. Sophia, Sta. Maria Chalcopratiana, and the Palace. The exo-narthex is about 19 ft., the narthex about 30 ft. wide, and both are about 200 ft. long; the height of the narthex is 43 ft., and is lit by nine windows above the roof of the exo-narthex; the church is about 262 ft. long externally, exclusive of the narthex and the projection of the apse, or 278 ft. long to the outside of the apse, and about 240 ft. wide. The nave consists of an oblong square, 110 ft. wide by 103 ft. long, with two vast hemicycles about 103 ft. in diameter at the east and west ends; and each of these have a subsidiary apse on each side, about 42 ft. in diameter, each supported by arches on two columns, and the square openings in the middle of the hemicycles are about 48 ft. wide, the eastern one ending in an apse about 40 ft. in diameter, with two tiers of windows in it, as well as windows in its semi-dome. The aisles, in the clear of the walls and front columns, are about 56 ft. wide.

The dome is about 103 ft. in diameter and 48 ft. high in the clear, and is lit at its base by forty windows, and is carried by the four arches of the nave, and the four vast spherical pendentives—four enormous piers about 35 ft. long over all and about 25 ft. thick at their widest point—have each a quarter of the weight of the dome, one arch and a pendentive to carry, the two projecting piers at the back of the first main pier are nearly 6 ft. square. These main piers, 25 ft. by 65 ft., are hollowed out by an oblong chamber about 13 ft. by 30 ft., and by the openings for the aisle and to the window, and have a net area of about 1,110 ft. super; they carry a portion of the gallery as well, but the external part of the pier is mainly an abutment. From the pavement to the crown of the dome is 185 ft.; but this is the new dome which was put up by the nephew or grandson of Isodore, and is said to be 25 ft. higher than the original one.

If you look at the plan of St. Sergius and Bacchus, you will see how well it deserved the title of "The little Sta. Sophia." It is an oblong square outside, with a projecting apse at the east end like Sta. Sophia, and if you cut the church in two in the middle on a line running north and south, and remove the two halves far enough away from each other to get in two more columns and arches, and turn the two half hexagons into semi-circles, you would have the precise form of the nave of Sta. Sophia, and to complete the resemblance you have only to clear away the angle niches of the aisles and insert four columns; only as Sta. Sophia has a nave about 110 ft. wide, and St. Sergius and Bacchus has its nave only about 53 ft. 6 in., with a hemispherical dome of the same diameter, all the supporting parts of the former had to be very much larger: if we take two of the angle piers of St. Sergius and Bacchus their sectional area together is about 95 ft., while the front half of one of the angle piers at Sta. Sophia has a sectional area of 537 ft., and this was not a brick or rubble pier, but one built of solid stone.

Returning to Sta. Sophia, you enter the

narthex at one end, and walk down this magnificent gallery, lined with slabs of lovely marble, panelled by means of projecting slips of white marble ornamented with what has been called the Venetian dog-tooth, capped with a carved marble string and pietra dura work. The groined vault of the narthex is covered with gold mosaic enriched with silver and colours. As you walk down it, you come to the bronze-plated jambs of the royal doorway in the centre, and step into the church. The sight that then meets your eye is thrilling, partly from its magnificence, but mainly from its overwhelming vastness. You are in a hall 110 ft. wide,—a width of hall you have never seen before, and, though the length is 265 ft., the eye embraces it at once, and the whole of the vast space is absolutely without anything intervening between you and the end of the apse, while above your head is the immense dome, seemingly supported on nothing, and below the arch is the crescent of the hemicycle, with its windows; the bulk of the light is overhead or screened by the columns of the aisles, and the windows in the apse, being partly of stained-glass, are not at first obtrusive, as you naturally throw up your head; the whole interior is lined with beautiful marbles, panelled like the narthex, and with pietra dura work in splendid patterns; the screen columns are monoliths of verd antique from Ephesus, presented by Constantine, the prætor of that city. The columns of the apses are of purple porphyry banded with bronze, and were presented to Justinian by a wealthy Roman widow named Marcia; they were probably taken from Palmyra by Aurelian to adorn his Temple of the Sun at Rome. The domes and vaults, as well as the walls above the marble lining, are adorned with gold mosaic enriched with slight patterns in colour. There is a subdued magnificence about the effect that is enchanting, though I believe the effect would be improved by repolishing the marble, as at present, the gold mosaic of the upper part overwhelms the dim pale colour of the lower marble work. It is not, however, until you go up into the galleries, each 250 ft. long by 60 ft. wide, besides the upper narthex 200 ft. long by 26 ft. wide, that you are fully aware of the vastness of the structure, and the altitude of the building is also better observed there, for although you are only 43 ft. above the pavement, the chandeliers with which the mosque is filled seem to touch the ground, and yet you seem no nearer to the dome; almost every trace of figures has been obscured] by the Mussulmans,—the very heads of the six-winged cherubims have been replaced by mosaic stars.

Justinian's pious boast when he opened the church, "Glory be to God who has thought me worthy to accomplish so great a work; I have vanquished thee, O Solomon!" strikes us as being only too modest, for he had caused to be erected a temple as superior in science and effect to Solomon's Temple, as the Pantheon is to an Indian wigwam,—he had in fact caused to be produced one of the wonders of the world.

In the description I have just given I tried to convey the impression made upon me on entering the church. There are, however, a few more particulars I should like to give you, although you can see most of these from the diagrams (see section of Sta. Sophia). The upper story is only five-sevenths of the lower one, and to make the arcades of the nave in tolerable proportion, six columns have been put over the four beneath, and round the upper apses of the hemicycle there are six columns over the two below, the effect of which is satisfactory. The height to the crown of the four main arches of the nave is not a fourth more than their width. The screen walls, which fill in the north and south aisles, above the upper arcades, are pierced with two ranges of circular-headed windows, so that the whole of the upper part is flooded with light. In looking from the floor of the nave at the arcades you are satisfied with them, but in looking down at the lower ones from the end gallery the capitals do not profile well; there is a want of style and accent about them which makes the whole of that piece of the composition look tame and feeble.

In the aisles, the twelve columns have rather the appearance of having been put in after the work was done; the position of eight of them has a sort of haphazard look, which is intensified by two of each, four being square piers, while the other two are round columns. One of the round ones of each group of four is nestled into a corner by the solid part of the subsidiary apse. The extra weight the square piers have to carry seems hardly a sufficient reason for making them square; still they are not unsightly.

The two inner columns of the screen, and the two behind them, tell their story well,—they act as stiffeners to the screen-wall, but, as in the aisles and the galleries, the columns had to be shorter than the screen ones to get in the groined vaults, ingenious devices have been hit on to accomplish this: in the aisles the arches between the front columns and the back ones are quadrants, in the galleries the difference of height is got over by each line of columns having its own wall over it, and these walls are joined at a higher level by a small barrel vault. The galleries show, alas! too many signs of the effect of the earthquakes with which Constantinople has been afflicted; vaults have opened, columns have been pushed out of the upright, and the marble slabs of the floors have cracked and sunk: these appearances, together with the iron ties, besides the original wooden ones, tell their own tale. The floor of the church is completely hidden, like that of all mosques.

It is, perhaps, hardly fair to criticise the outside, as it is doubtful if it was ever finished, and since the completion of the church many additions have been made to increase its stability. The dome being planted on a square terrace is depressed by the perspective, and you only see a flat segment rising above the buttresses at the sides of the windows of the dome. The narthex, with its large semi-circular windows divided by a transum and columns, looks like a riding-school or a factory; the enormous buttresses below hardly explain themselves, and are not lovely to look on. The north and south sides have each two enormous towers reaching to the terrace of the dome, the last stories being round-headed; these towers almost look as if they were of pre-historic times; between them the circular-headed walls of the aisles are filled with vast circular-headed windows, and look as if they were workshops added to a railway station. The whole exterior is covered with whitewash and narrow stripes of ruddle. Externally you would take it for a factory, or an overgrown railway station, added to by an engineer. It is not unpicturesque, as seen from the entrance to the Bosphorus, with the sun setting behind it; you see a heavy square reddish lump with a flat dome, but it compares very unfavourably with the fine outline of the great Turkish mosques.

It will, I think, be now interesting to hear the account Procopius gives of the difficulties encountered in the building. These difficulties, if real, show that the architects were not very perfect in their knowledge, or, if the difficulties were imaginary, that they were adroit courtiers. There is something dramatic in human difficulties and emotions that attracts our attention and enlists our sympathies, while these sympathies are not touched when the skill of the architects is so great that we hear of nothing but the completion of the building. Viollet-le-Duc sneers at the twelfth-century architects, who were always seeing visions, or having angels visit them to help them out of their difficulties; but for that very reason we feel a personal interest in them, and a kindliness towards them which we do not feel towards their more skilful successors. There is hardly a passage of such interest in the whole thirty-seven books of Pliny's "Natural History" as that in which he recounts the architect's trouble with the lintels when he was building the Temple of Diana of the Ephesians. Pliny says:—"The great marvel in this building is, how such ponderous architraves could possibly have been raised to so great a height." This, however, the architect effected by means of bags filled with sand, which he piled up upon an inclined plane until they reached beyond the capitals of the columns; then, as he gradually emptied the lower bags, the architraves insensibly settled in the place assigned them. But the greatest difficulty of all was found in laying the lintel which he placed over the entrance door. It was an enormous mass of stone, and by no possibility could it be brought to lie level upon the jambs which formed its bed; in consequence of which, the architect was driven to such a state of anxiety and desperation as to contemplate suicide. Wearied and quite worn out by such thoughts as these, during the night, they say, he beheld in a dream the goddess in honour of whom the temple was being erected; who exhorted him to live on, for that she herself had placed the stone in its proper position; and such in fact, next morning, was found to be the case, the stone apparently having come to the proper level by dint of its own weight (Pliny, "N. H.," Book xxxvi., cap. 21).

We must be thankful for small mercies in the way of contemporary history of architecture, as we mostly have none at all; but when we know that Procopius had been the secretary of Belisarius, on whose courage and skill the very existence of the Byzantine Empire depended, and that he subsequently became a senator and prefect of the city, we think he might have learned the names of the parts he describes and the real particulars from the architects themselves; but he behaved just like a modern historian does who describes battles,—there are pages, if not chapters, describing the charges and the carnage, but when you have read the description you do not see why the losing side should not have won. The historian never thinks of asking a master of the art of war the causes of the victory. I now give you extracts from Procopius about the method of building the piers, and about some of the troubles encountered; he speaks, in the first place, of the main piers supporting the four great arches, as follows:—"The Emperor Justinian and the architects Anthemius and Isodorus used many devices to construct so lofty a church with security. One alone of these I will at this present time explain, by which a man may form some opinion of the strength of the whole work. As for the others, I am not able to discover them all, and find it impossible to explain them in words. It is as follows:—The piers of which I just now spoke are not constructed in the same manner as the rest of the building, but in this fashion: they consist of quadrangular courses of stones, rough by nature, but made smooth by art. Of these stones, those which make the projecting angles of the pier are cut angularly, while those which go in the middle parts of the sides are cut square. They are fastened together, not with what is called unslaked lime, not with bitumen—the boast of Semiramis at Babylon,—nor anything of the kind, but with lead, which is poured between the interstices, and which, pervading the whole structure, has sunk into the joints of the stones, and binds them together: this is how they are built." I may say on this, than Professor Unwin has found by experiment that lead is the worst material that can be used to bed stone on.

Procopius then goes on as follows to tell us of the behaviour of these piers, while the arches were being turned:—"The above is an account, written in the most abridged and cursory manner, describing in the fewest possible words the most admirable structure of the church at Constantinople, which is called the Great Church, built by the Emperor Justinian, who did not merely supply the funds for it, but assisted it by the labour and powers of his mind, as I will now explain. Of the two arches which I lately mentioned (the architects call them 'lori'),—that one which stands towards the east had been built up on each side, but had not altogether been completed in the middle, where it was still imperfect. Now, the piers upon which the building rested, unable to support the weight which was put upon them, someho wall at once split open, and seemed as though before long they would fall to pieces. Upon this, Anthemius and Isodorus, terrified at what had taken place, referred the matter to the Emperor, losing all confidence in their own skill. He, at once, I know not by what impulse, but probably inspired by Heaven, for he is not an architect, ordered them to carry round this arch; for it, said he, resting upon itself, will no longer need the piers below.

Now, if this story were unsupported by witnesses, I am well assured that it would seem to be written in order to flatter, and to be quite incredible; but as there are many witnesses now alive of what then took place, I shall not hesitate to finish it. The workmen performed his bidding, the arch was safely suspended, and proved by experiment the truth of his conception."

I may say here that if this application to Justinian was not an adroit piece of flattery, and the architects were really in anxiety, they must in the first place have greatly trusted to luck, for in modern practice the architects would have made themselves sure that the piers would carry the weight before a stone was laid. Next, if they were really alarmed, why did they consult Justinian? unless, indeed,

the old fiction of the Roman Emperors being gods was still believed, for Procopius says Justinian was no architect. This splitting open as though it would fall to pieces may have been an exaggeration of Procopius. There may have been some slight cracking or scaling from imperfect bedding that the architects were not really alarmed about. We see what Justinian thought, that when the arches were complete they were held up by vertical friction against the piers. If the piers absolutely split open what did it mean? Procopius tells us nothing but the fact, and leaves us to infer that no reparations were made. We naturally suppose that all the work was carried up evenly to the same height, and that if serious settlements took place, that it was from the arches being on a comparatively small surface, which caused the foundations and that part of the pier to compress, and so tore it away from the adjoining part; but, if this were so, they would hardly have dared to let it remain, so I think the uneven pressure caused a few hair cracks which were exaggerated by common rumour, for if these piers had split through, and looked as if they would tumble to pieces, we can hardly imagine that the architects would have ventured to complete the arches upon them and put a dome on the top as well. Procopius goes on to say:—"So much, then, for this part of the building; now, with regard to the other arches—those looking to the south and to the north—the following incidents took place: When the arches (called 'lori') were raised aloft during the building of the church everything below them laboured under their weight, and the columns which are placed there shed little scales, as though they had been planed. Alarmed at this, the architects again referred the matter to the Emperor, who devised the following plan. He ordered the upper part of the work that was giving way where it touched the arches to be taken down for the present, and to be replaced long afterwards when the damp had thoroughly left the fabric. This was done, and the building has stood safely afterwards, so that the structure, as it were, bears witness to the Emperor."

This case is very simple, the arches were probably of brick, and while coming to their bearings pressed on the screen wall, filling the space between the piers, and caused a scaling of the columns at top and bottom; many now have bronze rings on the necking, and at the base. Justinian's advice was right; but we cannot believe the architects did not know what to do in such a case; probably the whole thing from beginning to end was a judicious piece of flattery to allow the Emperor to exhibit his extraordinary wisdom.

THE LONDON COUNTY COUNCIL:

ADOPTION OF NEW BUILDING BY-LAWS.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon, Sir John Lubbock in the chair.

The Building Act Committee reported that—

"By section 31 of the Council General Powers Act, 1890, power is given to the Council to make By-laws relative to the following matters:—(1) the description and quality of the substances of which plastering is to be made; (2) the mode in which, and the materials with which, any excavation made within a line drawn outside the site of a house, building, or other erection, and at a uniform distance therefrom of 3 ft., is to be filled up; (3) the duties of District-Surveyors in relation to plastering or excavation, and the regulation of the amounts to be paid to District-Surveyors in respect of the duties imposed upon them by any such By-laws. We have prepared draft by-laws relative to these matters, and submit the same with this report. We have also amended the existing By-laws made under section 16 of the Metropolis Management and Buildings Acts Amendment Act, 1878, with reference to foundations and sites of buildings, &c., and submit the same for approval. We recommend—

'That the proposed new and amended By-laws be made by the Council; and that the Committee be authorised to take the necessary steps for obtaining confirmation of the same, under the provisions of section 16 of the Amendment Act of 1878.'"

The recommendation was unanimously adopted, without discussion.

The following is the text of the By-Laws to be submitted to the Home Secretary for confirmation:—

"*Description and Quality of the Substances of which Plastering is to be made.*

All laths used for plastering shall be sound split laths free from sap, but iron or other incombustible laths, wire netting, or other suitable material to the satisfaction of the District Surveyor may be used.

Plastering or coarse stuff shall be composed of lime and sand in the proportion of 1 of lime to 3 of sand, mixed with water and hair, but Portland cement, Keene's cement, Parian cement, Martin's cement, Selenitic cement, or other approved cement or plaster of Paris, may also be used for plastering.

The lime to be used must be freshly-burned lime.

The sand to be used must be clean, sharp sand, free from loam or earthy matter.

The hair to be used must be good and sound, and free from grease or dirt; 1 lb. of hair to be used to every 3 cubic feet of coarse stuff.

The setting coat shall be composed of lime or cement mixed with clean washed sand, or of cement only.

Clear water only is to be used in mixing the material.

The Portland cement to be used must weigh not less than 90 lbs. to the imperial bushel.

Fibrous slab or other slab plastering of sufficient thickness, and securely fixed, may be used on ceilings, partitions, and walls, to the satisfaction of the District Surveyor.

As to the Mode in which and the Materials with which any Excavation Outside the Site of a Building is to be Filled Up.

Any excavation made within a line drawn outside the site of a house, building, or other erection, and at an uniform distance therefrom of 3 ft., shall be filled up with the natural soil or with brick or dry rubbish or other suitable material to be approved by the District Surveyor, not consisting of, nor impregnated or mixed with any fæcal, animal, or vegetable matter, or with dust or slop or other refuse, and shall be properly rammed.

Duties of District Surveyors.

It shall be the duty of each District Surveyor on receiving notice of the commencement of any house, building, or other erection, or on his becoming aware that any house, building, or other erection is being proceeded with, or that any excavation is being made within a line drawn outside the site of a house, building, or other erection and within 3 ft. therefrom, to see that the plastering is of the description and quality prescribed by, and that any excavation is filled up with the material and in the manner specified in the foregoing By-laws.

Fees to be paid to District Surveyors.

There shall be paid to the District Surveyor in respect of his supervision of the plastering of any house, building, or other erection, and in respect of the filling in of any excavation made outside the site of any house, building, or other erection, and within a distance of 3 ft. therefrom an inclusive fee of 5s., such fee to be payable in the manner and at the time specified in section 51 of the Metropolitan Building Act, 1855.

Penalties.

In case of any breach of the provisions contained in these By-laws, the offender shall be liable for each offence to a penalty not exceeding five pounds, and, in each case of a continuing offence, to a further penalty not exceeding forty shillings for each day after notice of such offence from the London County Council or the District Surveyor.

Repeal of previous By-laws.

The heretofore subsisting By-laws made by the Metropolitan Board of Works on October 3, 1879, and January 22, 1886, and confirmed by the Secretary of State for the Home Department on October 6, 1879, and June 23, 1886, are hereby repealed, and in lieu thereof the following are made:—

Foundations and Sites of Buildings.

No house, building, or other erection, shall be erected upon any site or portion of any site which shall have been filled up or covered with any material impregnated or mixed with any fæcal, animal, or vegetable matter, or which shall have been filled up or covered with dust, or slop, or other refuse, or in or upon which any such matter or refuse shall have been deposited, unless and until such matter or refuse shall have been properly removed, by excavation or otherwise, from such site. Any holes caused by such excavation must, if not used for a basement or cellar, be filled in with hard brick or dry rubbish.

The site of every house or building shall be covered with a layer of good concrete, at least 6 in. thick, and smoothed on the upper surface.

The foundations of the walls of every house or building shall be formed of a bed of good concrete, not less than 9 in. thick, and projecting at least 4 in. on each side of the lowest course of footings of such walls. If the site be upon a natural bed of gravel, concrete may be omitted from the foundations of the walls, with the approval of the District Surveyor.

The concrete must be composed of clean gravel, broken hard brick, properly burnt ballast, or other hard material to be approved by the District Surveyor, well mixed with freshly burned lime or cement in the proportions of 1 of lime to 6, and 1 of cement to 8 of the other material.

Description and Quality of the Substances of Walls.

The external walls of every house, building, or other erection shall, except in the case of concrete buildings, be constructed of good, hard, sound, well-burnt bricks, or of stone.

Similar bricks shall be used in the portions of party and cross walls below the surface or level of the ground, and above the roof, including the chimney stacks. Cutters or malms may be used in arches over recesses and openings in, or for facings of, external walls.

Stone used for the construction of walls must be free from vents, cracks and sand-holes, and be laid on its natural bed.

All brick and stone work shall be put together with good mortar or good cement.

The mortar to be used must be composed of freshly burned lime and clean sharp sand or grit, without earthy matter, in the proportions of 1 of lime to 3 of sand or grit.

The cement to be used must be Portland cement, or other cement of equal quality, mixed with clean, sharp sand or grit, in the proportions of 1 of cement to 4 of sand or grit.

Burnt ballast or broken brick may be substituted for sand or grit, provided such material be properly mixed with lime in a mortar mill.

Every wall of a house or building shall have a damp-course throughout its whole thickness, of asphalte or other material impervious to moisture. The damp-course in external walls shall be at a height of 1 ft. above the level of the ground directly abutting upon the external wall, and in the party and internal walls at a level of not less than 6 in. below that of the lowest floor.

The top of every party-wall and parapet-wall shall be finished with one course of hard, well-burnt bricks set on edge, in cement, or by a coping of any other waterproof and fire-resisting material, properly secured.

Whenever concrete is used in the construction of walls, the concrete used shall be composed of Portland cement and of clean Thames or pit ballast, or gravel, or broken brick or stone, or furnace clinkers, with clean sand, in the following proportions, viz., 1 part of Portland cement, 2 parts of clean sand, and 3 parts of the coarse material, which is to be broken up sufficiently small to pass through a 2-in. ring.

The proportions of the materials to be strictly observed, and to be ascertained by careful admeasurement; and the mixing, either by machine or hand, to be most carefully done with clean water, and, if mixed by hand, the material to be turned over dry before the water is added.

The walls to be carried up regularly and in parallel frames of equal height, and the surface of the concrete filled in the frame to be left rough and uneven to form a key for the next frame of concrete.

The thicknesses of concrete walls to be equal at the least to the thicknesses for walls to be constructed of brickwork prescribed by the 12th section in the First Schedule of the Metropolitan Building Act, 1855.

Such portions of concrete party-walls and chimney-stacks as are carried above the roofs of buildings to be rendered externally with Portland cement.

Duties of District Surveyors.

It shall be the duty of each District Surveyor, on receiving notice of the commencement of any house, building, or other erection, or of any alteration or addition, or on his becoming aware that any house, building, or other erection, or any alteration or addition, is being proceeded with, to see that the provisions of the foregoing By-laws are duly observed (except in cases where the London County Council may have dispensed with the observance thereof), and to see that the terms and conditions upon which any dispensation may have been granted, are complied with.

Fees to be Paid to District Surveyors.

The District Surveyor shall in respect of the erection of any house or other building be entitled to receive the sum of five shillings, the same to be taken and deemed to be a fee due to such District Surveyor in respect of the duties imposed upon him by the Metropolis Managements and Building Acts Amendment Act, 1878, and these By-laws; such fee to be payable in the manner and at the time prescribed by section 51 of the Metropolitan Building Act, 1855. The District Surveyor shall also, in every case where in respect of any breach of these By-laws, or of the above Act of Parliament, an application shall have been made by him to a Justice, and an order made thereon, be in like manner entitled to receive the sum of ten shillings in addition to the before-mentioned fee of five shillings.

There shall be paid to the District Surveyor, in respect of his supervision of any building constructed wholly or in part with concrete walls, a fee, one-half more in amount than the fee to which he would be entitled under the Metropolitan Building Act, 1855, for new buildings or additions. No additional fee is, however, to be charged in respect of any alteration to a concrete building.

Deposit of Plans and Sections.

On notice being given to a District Surveyor of the intended erection, re-erection, alteration of, or addition to a public building, or a building to which section 56 of the Metropolitan Building Act, 1855, applies, it shall be the duty of the person giving such notice to deposit plans and sections of such erection, re-erection, alteration or addition with the District Surveyor. Such plans and sections shall be of sufficient detail to show the construction.

On notice being given to the District Surveyor of the intended erection or alteration or addition to any house, building, or other erection other than a public building, the District Surveyor may, if he think fit so to do, by notice in writing, require the person giving such notice to produce a plan or plans and sections of any such house, building or other erection, or of the intended alterations or additions thereto, for his inspection.

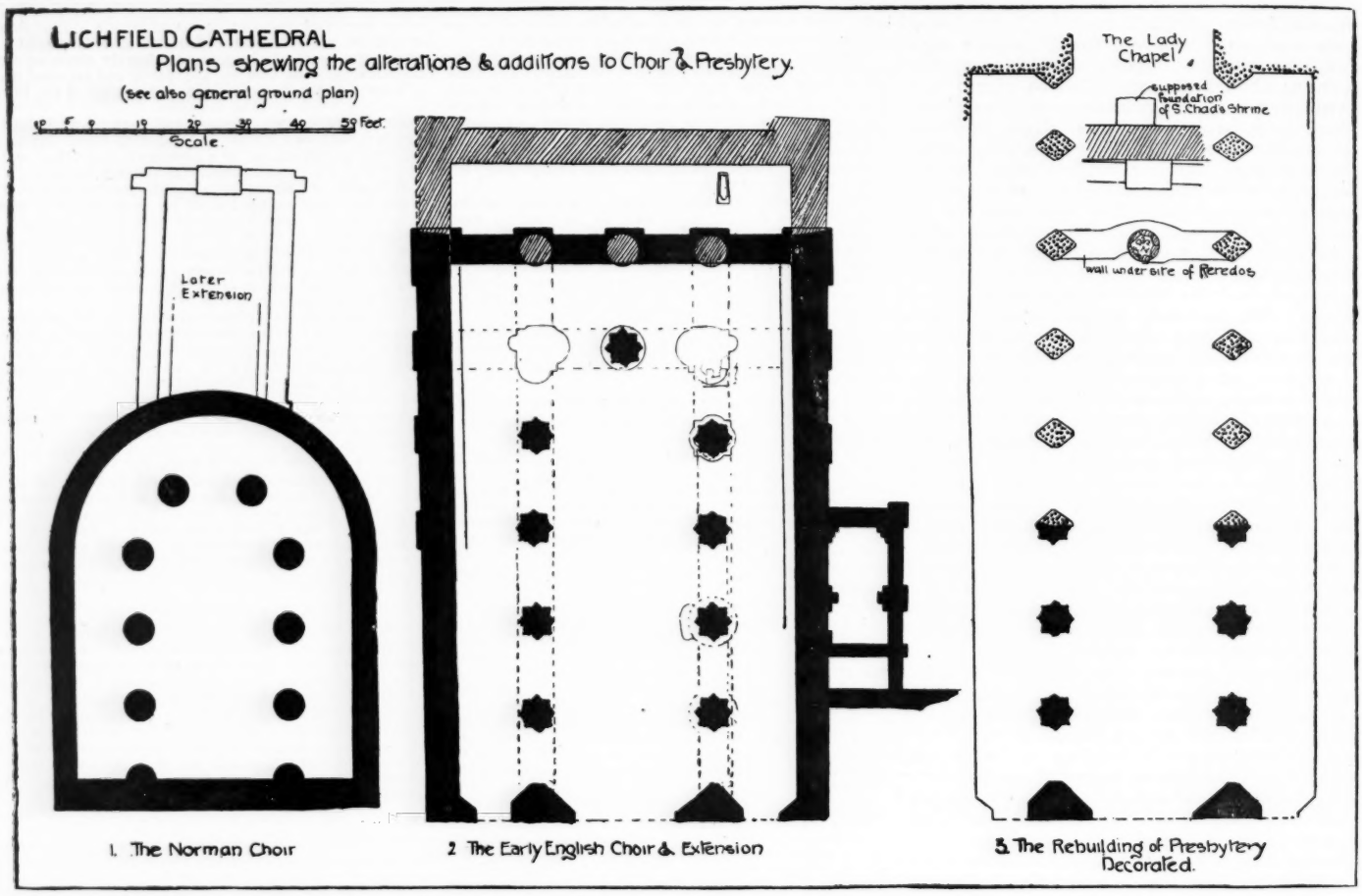
Penalties and Dispensation.

In case of any breach of any of the provisions contained in these By-laws, the offender shall be liable for each breach to a penalty not exceeding five pounds, and in each case of a continuing offence, to a further penalty not exceeding forty shillings for each day after notice of such offence from the London County Council or the District Surveyor.

In any case in which the Council think it expedient they may dispense with the observance of any of the foregoing By-laws, or any part thereof, upon such terms and conditions as they may think proper, and in case of the non-observance of any terms and conditions upon which the Council may have dispensed with the observance of any of the foregoing By-laws, then such proceedings may be taken, and such liabilities shall be incurred, as if the same had been enacted by such By-laws.

After transacting a great deal of other business, the Council adjourned.

THE IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).—The directors of the Improved Industrial Dwellings Company (Limited), have issued their annual report, and recommend the usual dividend at the rate of 5 per cent. per annum on the stock, and a like dividend on the deferred shares. The Company now possesses forty-four estates in various parts of the metropolis, on which 5,388 dwellings have been built for occupation by about 27,000 persons of the working classes, and 104 are in course of erection and completion. The expenditure on capital account has now reached 1,061,991*l.*


LICHFIELD CATHEDRAL
Plans shewing the alterations & additions to Choir & Presbytery.
(see also general ground plan)
Scale.
Later Extension
The Lady Chapel
Supposed foundation of S. Chad's Shrine
wall under site of Reredos
1. The Norman Choir
2 The Early English Choir & Extension
3. The Rebuilding of Presbytery Decorated.

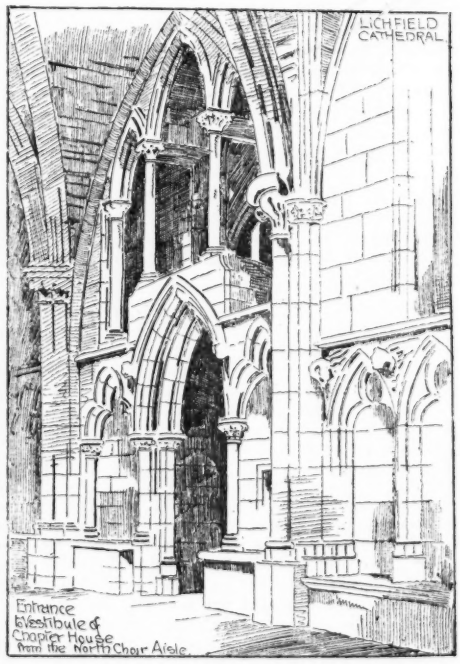
Illustrations.

LICHFIELD CATHEDRAL.

THE early history of Lichfield, like that of most of our cathedrals, is considerably mixed up with legendary lore, vague accounts of massacres, and the wonderful occurrences surrounding the life of the Patron Saint. The later history of the See has been so full of detail and memorable occurrences that this earlier history is, perhaps more than is usually the case, placed in the background. Its very position, in the centre of England, and in the midst of one of the principal fields on which the Civil Wars were fought, rendered it more liable to mutilation than probably any other cathedral in the country; the fact that its close was a fortified one, made its cathedral an object of attack; and, lastly, the merciless treatment it received from the Parliamentary soldiers in the first place, and from Wyatt in later times by "restoration," filled to the full its cup of misfortunes. The purely historical matter is outside the limits of the present article, except where it bears directly on the building itself. The Cathedral, as we see it today, and of which we give a large view from the north-west, a plan, and sketches, is the result of many years of patient labour and skill devoted to its restoration, and the result must, as a whole, be pronounced to be highly satisfactory. Dealing, in the first place, with the plan, we find a simple and straightforward scheme of design. A nave of eight bays with aisles and two western towers, transepts with eastern aisles, a choir of eight bays with aisles, and Lady Chapel at the east end, the Chapter House on the north, approached by a vestibule, and on the south an ancient sacristy —all these, as will be seen on reference to the plan, make up a very symmetrical whole.

The gradual growth of the building is a point of interest, both in itself and as an example to compare with the growth of other buildings coeval with it. In 1860 the Cathedral was undergoing a thorough restoration by the late Sir G. G. Scott, and in the course of the alterations and the sweeping away of Wyatt's excrescences, the foundations of the early buildings were discovered, and at that time carefully plotted. A paper, by Professor Willis, read before the Archæological Institute in 1861, gives the result of the exploration. We are also able, by the kindness of Mr. St. John Hope, F.S.A., to give a series of plans showing the gradual growth of the eastern arm of the church. This should also be taken in conjunction with the larger plan of the whole building, on which has been shown the relative position which the early bears to the present structure. The only portion of the Norman building the date of which is uncertain, is the choir or presbytery, with its semi-circular apse. (See Plan I. and the general plan.) The lines of the choir of this early church, which probably extended to about 90 ft. westward of the present central tower, seems to have been followed in later times, although some of the buildings of intermediate date show deflexions south. The first growth, a small one, was a rectangular chapel extending beyond the Norman apse for a distance of 38 ft., and with a slight inclination to the south. (See Plan I.) The next change was of a very complete character, involving the destruction of the superstructure of Norman times, and substituting an Early English choir. This thirteenth-century building, which is the first which appears above ground in the cathedral as it stands at present, was apparently planned to enclose the early church, the inner face of its walls almost abutting on the outer face of the earlier ones. It extended also further eastward, and had a square termination. The plan No. 2 shows what the form and dimensions of this church in all probability were, and also the future extension which, like the Norman Church, it underwent, an extension of two bays further to the eastward, giving four altars across its eastern wall. Of this eastern wall considerable traces exist under the present pavement, and are shown (slightly hatched) on the larger ground-plan, passing under the seventh north and south piers of the present presbytery. It will also be noticed that this late extension deviated from the straight line of the first design,—it had, as the Norman addition had, a slight inclination southward. The deflexion is also to some extent visible at present in a mass of masonry outside the second buttress (counting from the eastward) of the south aisle, which is evidently a portion of the footing or plinth of this earlier building. At this period, too, a sacristy was built on the south side of the choir, and an additional room on its west side, which may have been a depository for valuables. Both of these also remain.

During the same century the re-construction of the transepts and the building of the beautiful Chapter House* and its vestibule took place, and before the end of the century the nave and a portion, at all events, of the west front had probably been built. It will be seen that the nave, although at right-angles with the transepts, is not in line with the choir. It seems probable that, as the Early English choir followed pretty closely the line of the Norman choir, so the transepts and the nave did likewise, and the divergence from the straight line, whatever its meaning, was in accordance with that of the earlier church. The extent of the deviation of the centre line of the choir from that of the nave is 5 ft. at the east



end of the Lady Chapel, a distance of nearly 200 ft. from the centre of the eastern arch of the central tower. The Chapter House and its vestibule follow the line of the choir, and are not parallel with the transept, and the same applies to the before-mentioned sacristy on the south.

We now come to the last and, to some extent, the most important change in the building. Walter de Langton became bishop in 1296, and like Beckington, at Wells, was a great benefactor as well as builder to his city and church.

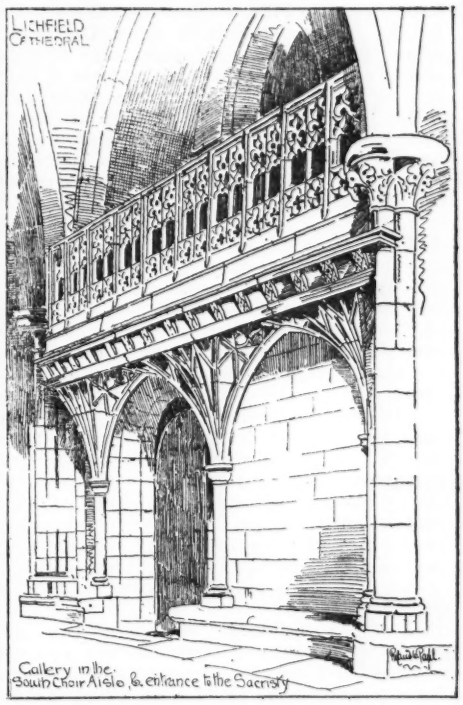
The Lady Chapel, as we see above, was commenced by him, and formed the beginning of

* The Chapter House is of two stories, the upper one, approached by a circular stair at the south-west angle, being used as a library

the remodelling of the Presbytery. The "feretrum," or shrine of St. Chad, was made at a cost of 2,000*l*, and placed immediately east of the great reredos (see g. on general plan), in a corresponding position to those at St. Albans and Westminster. Langton's successor, Roger de Norburgh (1322-1359), carried on the scheme of rebuilding westward, by finishing the Lady Chapel (for which money had been left by Langton), pulling down the Early English work as far as the third bay eastward of central tower and rebuilding the Presbytery, making the eastern arm of the church of eight bays (exclusive of the Lady Chapel) instead of seven as before (see plan 3 and general plan). The central gable of the west front and the two western steeples were Norburgh's work. Only the south-west or Jesus steeple remains, however, in its original state, the north-west tower above the cills of the belfry windows having been rebuilt in Perpendicular times in imitation of the earlier work. The height of this tower is not so great as the "Jesus" steeple by nearly 2 ft., and the spire is also shorter. The central spire was rebuilt by Bishop Hacket (1661-9), to whose energy is due the restoration of the Cathedral after its spoliation during the Civil Wars.

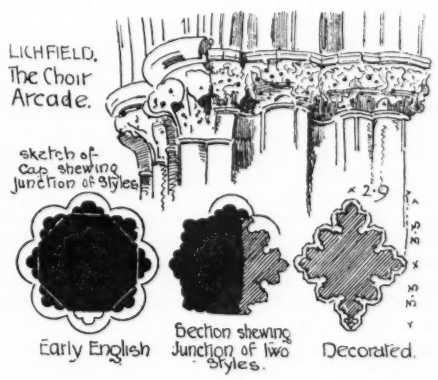
Of the ancient fittings of the Cathedral as it stood in the fifteenth century not a vestige remains. In 1643 the close, protected by a wall and ditch, was garrisoned for the King, and during the next three years it underwent three sieges, being finally surrendered to the Parliamentary forces on July 10, 1646. In 1643 the pillage took place. A clean sweep was made of the ornaments of the church, and the records were destroyed; the brasses were taken from their slabs, and the main structure itself had suffered severely by the destruction of the central spire, and damages from the fire that had been kept up on it during the siege. Of what little might have remained down to the period of Wyatt's restoration, or "improvements" as they were at that time called, we have to-day but two or three monuments left; two early effigies, one said to be that of Bishop Langton, who was buried first in the Lady Chapel and afterwards removed to where Bishop Hacket's monument now stands, and the other supposed to be Bishop Patteshull (1243). They are now behind the choir stalls under two arches of the south arcade (w and x

on plan) and are both of Purbeck marble. There is also a sixteenth-century monument opposite in the south wall to Sir John Stanley, of Pipe (1515) with an effigy under a canopy, and at one or two points in the nave and choir (see plan) a remarkable type of monument consisting of two recesses in the wall, resembling aumbries in size, containing the head and feet of an effigy. Three fourteenth-century monuments between the buttresses on the south side of the Lady Chapel have been restored as a memorial to Bishop Selwyn, whose effigy is placed in the central chapel. An interesting effigy of an archdeacon also remains under what was a rich Decorated canopy, outside the south end of the east aisle of the south transept. Traces of the Chapel of Dean Yotton are still to be seen outside the wall of the north nave aisle, where a four-centred arch with most delicate carving in the spandrils still remains,—now blocked up. Other special features of the building are the Chapter House, with its arcading and vestibule; the sacristy, on the south side of the choir, with a stone gallery projecting into the choir aisle



(said to have been for the exhibition of relics to the pilgrims on their way to the shrine of St. Chad); and the monument of Bishop Hacket, formerly in the south transept, and removed here about 1787, with some good heraldic work on the splay of the window, which is here deeper than the others. There is a broad double band of foliage on the splay of this window, which was probably inserted when Dean Heywood's monument occupied the site.

There is some curious work in the details of the early walls of the choir, and the treatment of the entrance to the vestibule from it on the north (see sketch). The junction of the two



dates occurs here both in the side walls and columns. The way in which the Early English column (an octagon of 5 ft. diameter surrounded by clusters of three engaged columns) was partially cut away and partially utilised in the new work is interesting. The plinth was kept, and the forms of the later clustered shaft were evidently designed with some regard to the earlier work. On the east faces of the arches at the west end of the choir aisles, is some Early work with chevron ornament (of similar character to the well-known work at Wells and Glastonbury), and probably one of the earliest pieces of work in the building.

The recent restoration under the late Sir G. G. Scott was really begun in 1856, but it was not until 1858 that the choir was handed over to be dealt with in a more extensive form. Wyatt's work has happily been effaced, a modern reredos has been erected on the site of the old one, and new stalls, a metal screen, and a metal pulpit have been provided. The organ, formerly over the choir screen, a composition partly in cement, by Wyatt, has now been removed to, and occupies the greater part of, the aisle of the north transept. Tiles, taken in a large number of cases from the old examples found, have been laid down in the choir, and there has been gradually springing up around the new altar a group of modern monuments to the memory of various dignitaries connected with the Church at Lichfield.* It is to be hoped that, when funds are procurable, a screen will be placed across the entrance to the Lady Chapel. It would vastly improve the interior which suffers, if in anything, from a lack of "mystery," besides being a restoration in some form of what originally was intended, and which actually did exist until the Civil Wars. Reverting to the plan once more, it is believed that this is the first time which it has been published to a large scale. All the chief dimensions have been checked and plotted on the spot, the sacristy has been reduced from drawings made during the restoration, and much information has been obtained as to the position of coffins and monuments from an excellent plan made by Mr. J. T. Irvine, to whom we are indebted for other information concerning the fabric. The plans showing the gradual enlargement of the Presbytery were made by Mr. St. John Hope, F.S.A., and Mr. Irvine, and have been kindly placed at our disposal for reproduction by the former gentleman.

The general view from the north-west, by Mr. W. H. Bidlake, shows the west front filled with its sculpture, the latest portion of the restoration, and which once more brings it back to something like its original beauty.†

BYZANTINE ARCHITECTURE.

THE plan and section of Sta. Sophia, at Constantinople, and those of St. Sergius, given in this number, form a portion of the illustrations to Professor Aitchison's second Royal Academy lecture, printed on previous pages.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of this Institute for the present session was held on Monday evening last, at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Obituary.

Mr. W. H. White (Secretary) announced the decease of Mr. Richard A. Hill, of St. Leonard's-on-Sea, Fellow; and also of Friedrich Baron von Schmidt, Hon. Corresponding Member, Vienna, and Royal Gold Medallist of the Institute.

The President said that they must all lament the death of their distinguished Corresponding Member, Baron von Schmidt, who had died at the early age of sixty-six. The Baron was full of honours, and was loved and respected by every one who knew him and came into contact with him, as he (the speaker) had the happiness of doing at Milan during the competition for the west front of the cathedral, when the Baron's wonderful judgment and exuberant vitality gave him a foremost place amongst the jurors. He had never had the opportunity of seeing the Baron's great work—the Town Hall at Vienna; but some of his earlier works, and especially his churches, showed a wonderful originality and much artistic grace. He thought they must all feel that not only the Institute, but Europe, had lost one of its most distinguished architects in the Baron von Schmidt.

The Royal Gold Medal for 1891.

The President: I have an announcement to make with reference to the Royal Gold Medal, and will call on the Secretary to read the By-law which affects it.

The Secretary having read the By-law,

The President said: The Council propose to submit to Her Majesty the Queen the name of

* By an error the monument of Archdeacon Moore, d. 1876, has been omitted on the plan. It stands in the next bay west of Bishop Hacket's monument in the south aisle

† We may mention here that the first of this series of illustrations of the Cathedrals of England and Wales, viz., Canterbury, appeared in the *Builder* for January 3. The third of the series (viz., St. Albans,—before the recent alterations), will appear in our number for March 7. Other cathedrals will be illustrated in the first numbers of succeeding months.

Sir Arthur W. Blomfield, A.R.A., as the recipient of the Gold Medal for the current year for his works as an architect. (This announcement was received with considerable applause.)

The School of Bramante, and its Expansion throughout Italy and the rest of Europe.

The President said he rose with more than ordinary pleasure to introduce Baron Henry de Geymüller, who had come all the way from Paris to read a paper on Bramante. Some among them would be glad to know—and he himself among the number—that the Baron was going to address them in their native language, though the four great European languages were equally familiar to the Baron, who could address them just as easily in one language as in another. Those who had made themselves familiar with the works that the Baron had with so much courtesy presented to the Institute Library knew that very well, as well as his sympathies and the depth of his knowledge. He was ashamed to say that he had not read one of the Baron's principal works—the life of the great French family of architects of the seventeenth century—the Du Cerceau; but he was told that it read like a novel. Then there were the Baron's Treatise on the Baths of Diocletian and Agrippa, on the Parthenon and Samothrace, and, above all, he would commend to their notice the work on St. Peter's. He would also like to remind the members that he believed the guest of the evening had said of English architects that they were the only architects who continued to use the tower,—or to build towers—in civil buildings. It was a curious fact, and he believed it to be a true one.

Baron Henry de Geymüller then read his paper bearing the above title. Before beginning the description of Bramante's career, and of the influence he exercised, the author indicated the place occupied by him in the architecture of the Renaissance in Italy. The development of that style might be considered to be due, above all. to the genius of four successive great masters,—Brunellesco, Leon Baptista Alberti, Bramante, and Palladio. The first created Tuscan or Florentine Renaissance; Alberti gave it a more Roman and general character; while in the hands of Bramante that style attained its complete and most perfect development, and had been made by him not only to be an *Italian* style, but a style as to its decorative principles capable of being universal. Palladio in several respects had been one of the propagators of Bramante's last manner, previously little known.

Bramante was born in 1444, at Fermignano, near Urbino, the son of peasants. The only precise facts that could be ascertained of the first twenty-eight or thirty years of his life were that while studying painting, as well as architecture, he had for masters Piero della Francesca and Andrea Mantegna, the first men of that time, not only as painters, but as masters in perspective. For masters in architecture he had Luciano da Laurana, the principal architect of the ducal palace at Urbino, and the master whose style in some measure most resembled that of Bramante; and Leon Baptista Alberti, who, as well as for the buildings erected from his designs, was famous for being the first modern writer on architecture.

The author then followed Bramante to Lombardy, where he might possibly have been led in consequence of the relations existing between the families of the Dukes of Urbino and those of Milan, and where he was to reside as one of the ducal painters and engineers. This title was also possessed by Leonardo da Vinci, with whom Bramante lived side by side for about eighteen years. The two references to Bramante's name in the writings of Leonardo, as well as the character of both those great men, permitted one to believe that their personal relations were rather cordial.

The author then mentioned the principal buildings which could be attributed to Bramante, pointing out in them those parts which were of importance for the history of Bramante's style, as well as that of the Renaissance. At Milan these buildings were the Church of S. Maria presso San Satiro, often, but erroneously, attributed to a pretended elder Bramante, or Bramantino da Milano, who never existed, but who obtained his imaginary birth from a confusion made by Vasari between some of the works of Bramante da Urbino and those of one of his pupils, the Milanese Bartolomeo Suardi, called Bramantino. Other notable buildings of Bramante were the façade of a church at Abbiate Grasso, begun 1477, and the lower half of the Rennaissance part in St. Maria delle Grazie, famous for the Cenacolo of Leonardo da Vinci in its refectory. The author believed that a door and three windows, executed about 1491, at the Como Cathedral, though never attributed to Bramante, ought to be assigned to him. After mentioning the Canonica di S. Ambrogio, Baron de Geymüller referred to the complete list of all the buildings erected, or merely begun, by Bramante which he had already published some ten years ago, and proceeded to show, by a letter from the Duke of Milan to his Ambassadors at Florence and Rome, that Bramante was expected to be in the latter town in 1493, no doubt for the planning of the celebrated Palazzo della Cancelleria, begun in 1495 from his design. The downfall of Lodovico il Moro and the conquest of Milan by the French caused Bramante to settle at Rome in 1499 or 1500. In 1502 his famous circular Tempietto of S. Pietro in Montorio had been already finished, and was published by Palladio amongst the ancient monuments as the only modern edifice worthy to be compared with them. The author did not dwell long on the Palaces of the Cancelleria and Giraud, which were still existing, as they were the best-known monuments of Bramante, and those by which generally at present an idea of his style was formed. He showed, however, that this idea was very incomplete. From the study of the original designs, many fragments of which he had been fortunate enough to discover, he derived the true features of those buildings of Bramante which either were only begun, or so altered as to render them unrecognisable. He himself thus understood that the reproach of tameness, or a want of apparent strength in the Orders which decorated those palaces, sometimes made against Bramante, was more true in appearance than in reality, and in no wise applicable to the whole of Bramante's style. He showed also that those buildings which by the principal writers of the sixteenth century were considered to have caused a revolution in architecture, and to be the beginning of the new style, formed precisely what he called Bramante's *ultima maniera*, or—Anglicised—"last manner." Of all these monuments that caused Bramante to be considered even by Michelangelo as the greatest architect that lived since those of Ancient Rome, one single one, the Tempietto of S. Pietro in Montorio, though incomplete, was standing. It was so small in size that, as a mere chapel, it could give no idea of the whole style, which could only be derived either from a close study of the monuments and their alterations, or from the fragments of the original designs that had come to light, although not always in a sufficient number. The principal monuments of this last manner were St. Peter's at Rome, the restoration of the Vatican palace, the new Court of Law in the Via Giulia, probably Raphael's own palace, and the Santa Casa at Loreto.

Having already published in fac-simile the greater part of Bramante's studies for St. Peter's that he had hitherto been able to discover, the author did not describe fully this mighty work, which he considered would have been, if erected according to Bramante's design, not only the largest, but also the most beautiful temple ever erected, uniting in it the glorious beauties of antique art, as well as some of the solemn impressions and aspirations of the Gothic style. He was convinced, after twenty-five years' study of this matter, that neither at Athens nor at ancient Rome, nor ever since, had any architect equalled the harmony and grandeur of that *ensemble*, with its cupola rising above a Greek cross (not a Latin one, as so often printed on an incomplete examination of Serlio's erroneous information), and accompanied with two, if not four, mighty towers at the extremities of the square base. The original designs showed how incomplete and erroneous was the principal information hitherto possessed on that subject, as, for instance, the belief that Bramante's piers were too weak, and inclosed in existing ones as a kernel in its fruit.

Some of the principal features of Bramante's style, and particularly of his last manner, were then described by the author, who was of opinion that the influence of those celebrated designs and models of Bramante had been immense and immediate on older as well as younger masters. The designs for St. Peter's influenced some elements in the numerous studies of Michelangelo and Giuliano da Sangallo in the competition of 1516 for a new façade of St. Lorenzo at Florence. Bramante had for draughtsmen, at the "fabric" of St. Peter's, Peruzzi, Antonio da Sangallo the younger, and many others, while Raphael d'Urbino had been his favourite pupil and successor. Both the Sansovinos had been employed by him, and all distinguished architects of Italy at Rome became acquainted with his designs and models. Thus they had reproduced in their own buildings at Genoa, Verona, and Venice parts of these designs and models which hitherto were believed to belong to their own invention.

The death of Raphael, of Leo X., and the sack of Rome were events which contributed to disperse his pupils over Italy; whilst French architects went to Rome, where they became acquainted with the followers of Bramante's last manner, as well as with the designs and models of the master himself. This was the case with Flemish as well as with Spanish and German artists, and thus the forms of the new style gradually spread over Europe. In numerous cases parts of their works reflect ideas taken from the designs of Bramante for the Vatican, St. Peter's, and other works. In this way Palladio, too, for whom the author professed an admiration equal to that exhibited in England, very often had become the propagator of ideas and forms belonging to Bramante in his last manner.

In conclusion, some of the characteristics of Bramante's art were described, the aim of which the author considered to have been, in the highest sense of the word, perfection. Bramante had had the fortune of having for masters the greatest artists then alive. Adding to the knowledge thus obtained that derived from nature by his study of proportions in the human body as well as that of the horse, on which subjects he wrote treatises now lost, Bramante became the most learned and scientific architect of his time. He always knew exactly for what reason he used a form. But he was also the one most endowed with the personal gift of creating that beauty which cannot be taught, and which the author designated "Beauty by the grace of God."

Thus the works of Bramante were (1) the result of all that science and knowledge of proportion teach; and (2 of the personal power of Bramante of creating beauty to a degree unsurpassed by any master before or after him, and extending as well to the majestic and powerful composition of the whole, as to the most lovely and minute detail of his ever-charming ornaments. In Bramante, after more than a thousand years of efforts in Italy, a perfect harmony was obtained between the southern and the northern elements expressing laws of universal truth, and sufficiently, too, the legitimate freedom of personal individuality.

A few words were added by the author on some of the methods by which architects at that time obtained their professional training.

Professor Kerr, on the conclusion of the paper, moved a vote of thanks to the Baron. At the present moment, he said, they in England were drifting, as an end, towards that state of things from which the Italians, of whom the Baron spoke so pleasantly, made their beginning. What he meant was that they were trending towards the reign of the universality of art. That principle had not been recognised in this country for ages, but it was now beginning to be recognised,—the idea that all art was one art, and all equally dignified and useful to the human race. Some of the leading architects of this country were now distinguishing themselves as designers of what a few years ago would have been considered as inferior subjects, and the treatment of which would have been left entirely to the manipulation of what were supposed to be inferior designers. At the period which they had been accustomed to call the revival of arts and letters in Italy, it was remarkable that almost all the architects were either painters, sculptors, or designers of some artistic matter; that was what we were now arriving at, but it was the point from which the Italians had started. Bramante might be taken as the leader of the great movement, which was now being perceived to be no sham,—the great movement constituted by the revival of Roman architecture on Roman ground. Mediæval or Teutonic architecture, as distinguished from the Latin, never took a hold on Italian ground to any great extent. When the Mediæval system of society had passed through a long course of decadence, it was necessary that something

new should be introduced as the basis of the new scheme. That referred to the whole intellect of man, architecture being always a very readable index of the position of intellect at the moment. It was necessary, especially in an ambitious age, that architecture should arise and reign, not only through the ordinary means of buildings constantly in need, but there was a desire to erect great monumental structures, which should be commensurate in dignity with the aspirations of the period, which were of a very exalted nature. Now, what were these artists, being universal artists, to do? It was said that they ought to have proceeded on something which was their own, and not to have taken that which belonged to the Romans. What did Bramante do, as a typical man? Bramante, it was said, devoted himself more earnestly than others to the study of the Roman remains with regard to their details. Roman architecture left off at the Colosseum. It might be said that it was bad architecture, but the Colosseum was the ultimate manifestation of the original Roman Classic orders, seen in the superficiation of a great building rather than as parts of the mere construction of the temples out of which these orders sprang. Therefore, when Bramante and others had to create a new architecture, where were they to go but to the Colosseum? The Gothic architecture, which was now going out of fashion, did not reach Italy with any force, and the Italians began exactly where their predecessors on Italian ground had left off. Thus it was that the Italian Renaissance style began; it was no sham, but a genuine modern European style. It sprang into existence from the careful manipulation of such men as Bramante, and acquired a strength which had carried it forward to the present day, and which would do so for generations to come. He would add one word as to the lesson to be learnt from the attitude of such men as Bramante. The Baron, perhaps, had heard of the "Queen Anne" style, so called, which, whatever its defects, had the merit of being the stepping-stone from their very admirable revived Gothic to the new revival of modern Classic. And what he thought they might advise young students to do was to follow Bramante by studying the old remains,—not the Gothic remains, for that had been well done,—but the Italian monumental buildings, and above all things the mouldings, as Bramante did. The mouldings of the "Queen Anne" style were abominable, but those of the coming style would be as sweet and admirable as they were on the soil of France.

Col. Lenox Prendergast (Hon. Associate), in seconding the vote of thanks, said the paper was on a subject in which he took the greatest possible interest. He thought that Baron de Geymüller had done them great service in reading his paper. He scarcely liked to follow in the wake of the words which had fallen from the mover of the resolution, because he had not the position occupied by Professor Kerr, giving him the right of criticising what was done in this country by the profession. At the same time, he ventured to think, if there ever was a moment in which it behoved those who had gone through various styles in connexion with their studies, to revert to the period which had been so eloquently described by the Baron, it was the time present. He did not express this as merely his own opinion, but as that of a late lamented Fellow of the Institute—the great historian of architecture — Mr. James Fergusson,—who, in his book on modern styles, urged upon them that that course was the one by which salvation was to be found. They had now come to this position in England, that there was a positive thirst for adequate Italian architecture. In everybody's house they would see the details they were longing for—of course, mixed up with a great many vulgarities of the "plush" period which was going on.

Professor Baldwin Brown expressed the pleasure he had in having the opportunity of making the acquaintance of Baron de Geymüller in person, most of them having known him from his books for a long time past. The most important work of Bramante was the design for the new St. Peter's, which the writer of the paper had spoken of as one of the noblest ever evolved from the brain of an architect, and which would have produced one of the greatest buildings in the world. It was not a little interesting that the same idea of plan, that of the Greek Cross and central dome, was before the mind of Sir Christopher Wren when he was designing St. Paul's Cathedral in London. Unfortunately in both cases, that plan was not carried out, and it still remained for an architect of the nineteenth century to carry out on a colossal scale a cathedral on that plan.

Mr. H. H. Statham said that Baron de Geymüller had referred to the very remarkable engraving, after Bramante, in the British Museum. It was a magnificent engraving, and was well worth a visit, as it seemed to sum up the whole spirit and peculiarity of Bramante's architecture. There were three other small engravings there, which he hoped were genuine, and which were marked Bramante in the catalogue. They were about 18 in. by 12 in., and were of very remarkable interest, as showing a quality in Bramante of which there was no evidence in the illustrations before them. They represented an architectural composition consisting of two parallelograms placed parallel, and in the middle a triumphal arch connecting them. Their peculiarity was in their being designed so that the mass of the two sides should be the same; the cornices being the same height. At the same time, they were treated absolutely diversely in every other respect. On the left hand was a building with a simple order of columns and entablature and the same repeated above. On the other side there was a building, of which the ground story was a round-arched arcade, above which there was an entablature treated quite differently, with a highly-decorated frieze. Above that, again, there was no order but the plain wall with windows, a plain attic above with round windows, and the final cornice again ranging with that on the other side. He hoped that Baron de Geymüller would not tell him that these drawings were spurious; but even if they were not Bramante's, they were remarkable instances of an attempt at that period to get rid of being bound down to symmetry in classical building. They were an attempt to treat a classic building with variety, the two sides balancing in mass, and yet being diverse in treatment, and any one interested in the subject would find it worth while to look at them. There was another remark he would like to make as to the light which had been thrown on the building of St. Peter's by Baron de Geymüller's book. They had heard it often said that the architects of the period were firstly painters and sculptors, one effect being that they were rather afraid of what they had to do in architecture. This was remarkably brought out by the illustrations, in the Baron's book, of St. Peter's at the various periods of its building. There they saw three or four great arches standing up in the air, with nothing to connect them, no one knowing apparently how to go on. It struck him that that gave one a new insight as to the tentative way in which the builders were then trying to do the work, and it was interesting to look at that book, and get the idea of the real way in which the building of St. Peter's was carried on.

Mr. Arthur Cates said he was disposed to consider Bramante as having greatly influenced the English school of Italian architecture. To Bramante, Sir William Chambers and the architects of his school may have been greatly indebted, and the Baron's observations could not have come at a happier time, as Professor Kerr had said, in calling attention to the careful study of details and to the manner in which Bramante devoted himself to such studies of detail which, unfortunately, had been too much neglected in this country by students. The Baron had referred to the stay of Bramante in Milan. Now, in Milan there was a remarkable church, which probably was known to most of those present, but which he believed Bramante never saw in its present condition. It was the Church of San Lorenzo, of which a considerable portion came to grief in the early part of the sixteenth century. That church, however, was built upon the foundations and plans of the Central Hall of the Great Baths of *Maximinianus Herculeus* about the year 250 of the Christian era, and there was in some respects a remarkable similiarity between the plan Bramante first sketched for St. Peter's,—the Greek cross,—and the church. He did not know whether the Baron had noticed that, and whether some of the first inspirations of Bramante might not have been derived from the study of the plan of the church before its restoration, which was carried out after the fall of the vaults. Probably, then, a good deal of the Roman work might have remained, and it might have been a more perfect monument than they saw it now. There were certain peculiarities in the plan of arrangement which led him to think that it was not improbable, in Bramante's study of the ancient monuments, as he went to Rome, his ideas and aspirations were first started by what he had seen of the Roman remains in Milan and other places, it was not unlikely, therefore, that in his first sketch for St. Peter's there appeared this Roman idea, which was given him by the Church of San Lorenzo.

The President, in putting the vote of thanks, said it had struck him, in what had been said of Bramante's many wonderful qualities,—his love of study and the way in which he studied the ancient examples,—that nothing had been said of another remarkable quality possessed by him, namely, his extraordinary readiness. Bramante was always ready when the opportunity presented itself to him, and when he had the opportunity of doing a great work, he prepared a design on the spot. He thus astonished his clients,—Popes or otherwise,—by designing the work that they wanted in a very short space of time. Now, that readiness and extraordinary industry was brought about in a large measure by the way in which he had improved his opportunities in youth, by studying the works of the ancients.

The vote of thanks was carried by acclamation.

Baron de Geymüller, in reply, said that if he had succeeded in imparting to any young member of the Institute a love for Bramante, he should not have come there in vain. As to the engravings Mr. Statham had referred to at the British Museum, he had not seen them, but he supposed they were the same as those in the Print-room in Paris, on which he read a small note. As to San Lorenzo, he was pleased to hear Mr. Cates allude to it, because there was one of the sketches for St. Peter's, in which there was a plan which undoubtedly appeared to be a fragment of the plan of San Lorenzo.

The President then announced that the next meeting would be held on Monday the 16th inst., and the proceedings terminated.

THE SURVEYORS' INSTITUTION:

STUDENTS' PRELIMINARY EXAMINATION.

OF the candidates who presented themselves at the preliminary examination of the Institution, held concurrently in London and Manchester on the 21st and 22nd ult., the following satisfied the examiners:—

Aldis, William H.	Lancaster, John R.
Andrews, Walter E.	Little, Henry
Barton, Harold	Liversedge, John W.
Bidwell, Philip S.	Marriage, Percy J.
Brinsley, Herbert G. W.	Martin, Samuel
Burder, Reginald E. C.	Morris, William H.
Buss, Septimus	Moxon, Harold
Chattell, David G.	Nanson, Laurence
Child, Charles, jun.	Neighbour, Charles E.
Christian, Percy	Nicholls, Edward A.
Davidson, Richard B.	Nicholson, Arthur W.
Dinwiddy, Donald	Norris, Arthur B.
Eadie, James J.	Pain, George L.
Eason, Edward W.*	Parker, Frederick W.
Everington, John	Roberts, Joseph W. G.
Farmer, Hugh Cecil	Sheppard, Alex. C. O.
Gayford, Herbert H.	Sly, Joseph T.
Gipps, George R.	Speke, Charles
Grailton, Wykeham C. J.	Stenning, Oswald F.
Hales, Arthur J.	Stevens, Sydney S.
Hawes, Frederick K.	Strouts, Lewis H.
Heasler, Holland C.	Tewson, Leonard
Hendry, Alfred	Thompson, Frederick H.
Hodges, Walter	Townsend, William
Holmes, John E.	Turnbull, William G.
Jenkinson, John	Watts, Rupert C.
Jones, Percy E.	Weatherhead, David W.
Keep, John P.	Williams, Henry C.
Kidman, Edward H.	Windsor, Arthur S.
Knight, George E.	Wyatt, Archibald

* Passed at head of List.

OLD NORWICH.—The February number of the *English Illustrated Magazine* contains an interesting article on Norwich by Mr. R. Owen Allsop, with sketches of old buildings drawn by Mr. C. O. Murray.

THE ASSESSMENT OF THE CITY OF LONDON.—Some interesting figures (says the *City Press*) are to be noted in connexion with the recent quinquennial assessment of the City. It appears that in all upwards of 15,000 separate properties had to be dealt with by the Assessment Committee of the City of London Union. The gross valuation, as finally determined upon, is 4,934,545*l.*, the net rateable value being 4,092,139*l.* The gross value in 1866 was 2,202,045*l.*, so that within the space of twenty-five years the valuation of the "one square mile" has more than doubled. Worked out, the valuation shows that the City is assessed at about 8,000*l.* an acre.

NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

THE annual meeting of this Association was held in Birmingham on Wednesday, the 28th ult. The President, Mr. J. H. Colls, occupied the chair, and was supported by Messrs. J. C. White, S. G. Bird, R. Neill, jun., J. S. Jones, hon. treasurer, C. W. Green, auditor, with the following members of the Council:—Messrs. Wm. Moulson, A. Krauss, Wm. Southern, T. F. Rider, Wm. Sapcote, John Bowen, Jos. Henry Marsden, C. Tomkinson, Alex. G. White, R. Beevers, W. Houldsworth, and in addition thereto representatives were present from London, Manchester, Liverpool, Bradford, Bristol, Birmingham, Bolton, Hull, the Potteries, Stalybridge, Kidderminster, Stoke-upon-Trent, Tunstall, Hanley, Plymouth, Northwich, Preston, Walsall, Newport (Mon.), Derby, and Truro.

The half-yearly report, read by the Secretary, after giving details of the various trade movements for increased wages and shorter hours in various parts of the country, went on to say that the officers and Council of the Association would continue to watch the Employers' Liability (Amendment) Bill in the course of its progress through Parliament, and proceeded:—

"The Council deem it their duty to the members of this Association to keep them reminded of the steadily increasing risks to which they are exposed by the working, under experience, of even the Liability Act at present in force, irrespective of the new one threatened. It is manifest that damages are more and more frequently awarded to injured workmen by the County Courts, even in cases of extremely doubtful liability, under the strict interpretation of the Act as it stands. Employers of labour may at any time be seriously mulcted in damages though no real default of their own—the only safeguard being insurance, of which all provident men should avail themselves, seeing that a serious accident might ruin a man in fairly good circumstances at any time. Every facility for insuring against all such risks is now afforded—first, by the Builders' Accident Insurance Company, started as an offshoot of this Association by members of its trades for mutual protection and assistance; second, it offers all possible security at the lowest rates consistent with such security."

The Chairman, in moving the adoption of the report, congratulated the members on the considerable accession of local Associations to the general Association. The masters had no wish to keep wages down if the men were justified in asking for more. With respect to labour movements, he would advise the masters to insist that they should meet the representatives not only of the unionist men, but of non-union men where practicable. With respect to the Employers' Liability (Amendment) Act, they would be glad to hear that the Association would continue to give it their attention. He wished the masters could hope for some relief from the hardships which they suffered already, but there seemed only the prospect of further hardships being thrust upon them. That was the tendency of the age, and he was afraid they could not fight against it.

Mr. J. C. White (Liverpool) seconded, and the resolution was adopted.

Mr. J. S. Jones (Liverpool), the hon. treasurer, submitted his audited accounts, which were duly approved and passed.

Mr. J. Bowden moved a resolution to the effect that a committee be appointed to confer with the general associations of the operatives with a view to establishing a general code of working rules for each branch of the trade, with the exception of rates of wages and hours of work.

Mr. J. Bowen seconded, but the general view of the meeting was that such a Board could not be got to work together, and on a vote being taken the proposal was defeated by a large majority.

Mr. J. C. White (Liverpool) was elected President for the ensuing year; Messrs. Robert Dennett, Nottingham (re-elected), and J. Bowen (Birmingham), Vice-Presidents; Messrs. S. G. Bird (London), W. H. Cowlin (Bristol), Robert Neill, jun. (Manchester), and J. H. Colls (London), Honorary Vice-Presidents; Mr. J. S. Jones (Liverpool), Honorary Treasurer; and Mr. W. C. Green (Liverpool), Honorary Auditor.

It was resolved that the next place of meeting should be Cambridge.

Mr. Bowen afterwards conducted the members over the New Law Courts, for the erection of which he is the contractor.

In the evening the members were entertained by the Birmingham Master Builders' Association at a banquet, Mr. C. H. Barnsley presiding.

THE INSTITUTE OF BUILDERS (INCORPORATED).

THE seventh annual general meeting of the Institute of Builders was held at the offices, 31 and 32, Bedford-street, London, W.C., on Tuesday, the 3rd inst. Mr. Thomas F. Rider, F.R.G.S., the President, occupied the chair, and the Secretary, Mr. Richard S. Henshaw, read the following report of the Council for the past year, viz.:—

"1. The Council have the pleasure to present their Seventh Annual Report to the Members of the Institute.

2. The question of altering the Articles of Association in such a manner as to allow of Past-Presidents becoming Honorary Vice-Presidents and *ex-officio* Members of the Council (so long as they continue Members of the Institute), mentioned in the last Report, was referred to the Council for further consideration, and a general meeting of the Members was held on November 4, 1890, when the necessary alterations, as drafted by the solicitor, were unanimously approved, and a subsequent confirmatory meeting on December 4, 1890, having been held, the necessary alterations have been made, and Mr. Stanley G. Bird, Mr. J. Howard Colls, Mr. Geo. Burt, and Mr. Frank May, —the first four Presidents of the Institute,—have thus become honorary Vice-Presidents, with a seat at the Council.

3. In the early part of the year the Council received from the Royal Institute of British Architects, the draft of proposed 'General Conditions of Contract,' which they suggest should take the place of those formally agreed between the Royal Institue of British Architects and the old 'Builders' Society.' The Council have appointed a Committee to go fully into the subject, who have held twelve meetings, and whose report it is expected will shortly be received.

4. The Council have during the past year been in correspondence with the Master Builders' Association of Boston, U.S.A., with reference to framing By-laws for that city, as well as with the National Association of Builders of America, whose friendly sentiments they desire heartily to reciprocate.

5. The advice of the Council was sought by the Building Act Committee of the London County Council, as to what improvement (if any) might be made in the duties and appointment of District Surveyors, and having given the matter careful consideration, a reply was sent embodying the views of the Council on the subject, of which a copy was sent to each Member; but the recommendations made (like those from other cognate societies whose opinion was asked), did not meet with the approval of the present Governing Body of London.

6. Several Bills were introduced into Parliament during the year, the principal of which was the 'Employers' Liability (Amendment and Consolidation) Bill.' Nothing has been done in the House of Commons in reference to this during the present Session, but notice of an amending Bill has been given, and on its being proceeded with it will receive the full attention of the Council.

7. In conformity with the announcement contained in the last Report the Council elected Robert Childerhouse to the Institute of Builders' Pension in the Builders' Benevolent Institution.

8. In addition to the usual grants from the Benevolent Fund to the Builders' Benevolent Institution, the Builders' Clerks' Benevolent Institution, and the Provident Institution of Builders' Foremen and Clerks of works, the Council have also had the pleasure of rendering some assistance to three private applicants.

9. In accordance with the Articles of Association, the President, Mr. T. F. Rider; one of the Vice-Presidents, Mr. R. J. Waller; the Treasurer, Mr. G. Plucknett; one or the Auditors, Mr. G. Burt, jun.; and four Members of the Council—Mr. John M. Burt, Mr. W. H. Clarke, Mr. Woodman Hill, Mr. R. Neill, jun.,—retire, but are eligible for re-election; and in consequence of Messrs. Bird, Colls, and May becoming by virtue of their Past-Presidentship Honorary Vice-Presidents, the Members are called upon to elect three additional Members of the Council."

On the motion of the Chairman, the report was received and adopted, and Mr. H. T. Ashby was unanimously elected President for the ensuing year. Mr. F. J. Dove and Mr. Robert Neill, jun. (Manchester), were elected Vice-Presidents; Mr. George Plucknett, J.P., was re-elected Treasurer; Mr. J. M. Burt, D.L., Mr. W. H. Clarke, and Mr. Woodman Hill were re-elected, and Messrs. Basil P. Ellis, Joseph Hill, J. Hunter Jones, Wm. Shepherd and Joseph C. White (Liverpool), were elected on the Council; Mr. Geo. Burt, jun., being re-elected one of the auditors.

A vote of thanks to Mr. Thomas F. Rider for his services as President during the past year concluded the proceedings.

NEW TOWN HALL, SALTCOATS.—Some time ago, in answer to an invitation, seventeen designs were sent in by architects for the proposed new Town-hall, Saltcoats, N.B. After consideration, the Commissioners (says the *Glasgow Herald*) were not satisfied with any one of the plans, and appointed a committee to endeavour to put into shape the views expressed in consultation. The committee prepared a pencil-sketch of the hall in accordance with the views expressed by the Commissioners. This sketch has been approved of, subject to such alterations as might appear advisable afterwards. The Commissioners agreed to invite architects who had sent in plans to state on what terms they would be willing to prepare complete plans for the new hall, taking the pencil-sketch as a basis.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—At a meeting of this Association, held on 27th ult., the question of better art training for architectural students was the subject of a discussion, which was opened by Mr. E. R. Taylor, the Head Master of the School of Art. Mr. Taylor laid down as points on which all were agreed that the present pupilage system is a good one, but that it needs supplementing; and that an architect must be an artist. From this Mr. Taylor argued that the artistic education of an architect was of the greatest importance, and that it should be wide and sound, and that as it was his artistic abilities which would alone distinguish him from the engineer and builder. No pupil should be articled until he had given proof of his possession of such abilities, and that for this some part of the elementary educational course and examination should precede the pupilage. Mr. Taylor discussed at considerable length the Examination scheme of the Royal Institute of British Architects, and of the Architectural Association's (London) education scheme, and pointed out that in both too little emphasis was laid on the artistic part of the profession.* He then gave in detail a scheme for the art education of architects, divided into elementary and advanced parts, and embracing study in freehand and model drawing, geometry, colour, design, proportion, modelling, light and shade, and the history of art, and pointed out the way in which such a scheme could be carried out at the School of Art at the same time that the Architectural Association classes gave the technical education required to supplement the office routine work.—Among those who took part in the discussion were Sir T. Martineau, who, as a member of the Committee of the School of Art, said he should welcome any scheme which brought the School and the profession more closely together.—Mr. T. Naden, President of the Architectural Association, said that his experience had proved the value of the School of Art training to be very great, and that he hoped Mr. Taylor's remarks would reach the Council of the Royal Institute of British Architects.—Mr. H. R. Lloyd proposed that, in order to give practical effect to Mr. Taylor's valuable suggestion, they should be submitted to a committee for careful consideration, and after some comments from Mr. W. Hawley-Lloyd (Vice-President), and from Mr. Newton and Mr. Freeman Smith, and others, this course was agreed to, and a hearty vote of thanks was accorded to Mr. E. R. Taylor for his able paper.

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 2nd inst. at the Royal Institution, Colquitt-street, Liverpool, Mr. E. P. Warren, of London, read a paper dealing with the "History of the Hearth." The lecturer strongly condemned some of the modern constructed chimney-pieces, which lacked architectural beauty both in design and execution. Chimney-pieces were, he declared, universally singled out for attractive treatment in nearly every household; and yet in many cases the advantages they afforded for such were dreadfully misused. Mr. Warren's remarks were illustrated with numerous sketches and photographs taken in Italy, France, Belgium, and also in this country. Mr. T. M. Reade, the President of the Society, occupied the chair. A vote of thanks was passed to Mr. Warren at the close of his lecture.

MANCHESTER ARCHITECTURAL ASSOCIATION.—At the ordinary meeting of this Association, held at the Diocesan Buildings on Tuesday last, Mr. T. Chadwick, President, in the chair, Mr. H. Ross, A.R.I.B.A., read a paper on "Houses for Working Men," a subject which he treated in a most exhaustive manner. A vote of thanks to the reader, proposed by Mr. Hodgson, and carried, concluded the proceedings.

CARDIFF ARCHITECTS' SOCIETY.—The first lecture this session, under the auspices of the Cardiff Architects' Society, was held at the Town-hall, Cardiff, on the 30th ult. The Rev. C. J. Thompson, M.A., presided, and there was a good attendance to hear Mr. H. D. Searles-Wood, F.R.I.B.A. (of the Architectural Association, London) lecture on "An Architectural Tour in Italy." The lecturer described the principal architectural features of Milan, Verona, Placenza, Bologna, Florence, Siena, Orvieto, Pisa, and Rome, and illustrated his subject by

* Perhaps Mr. Taylor will explain how he proposes to test artistic capabilities by an examination.—ED.

a large number of admirable photographs. At the close of the lecture Mr. J. P. Seddon, F.R.I.B.A., moved a vote of thanks to the lecturer, and Mr. E. Seward, F.R.I.B.A., in seconding, said it was the intention of the members of this newly-formed society to have lectures at intervals which would be interesting to the public as well as to the members. The resolution was carried unanimously, and a vote of thanks to the chairman concluded the proceedings.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the usual fortnightly meeting of this Association, held on the 29th ult., Mr. John Kinross presiding, a paper was read by Mr. Thomas F. Binnie, valuator, the subject being "Are architects and builders adversely affected by present system of feu-duties and taxation?" In the course of his remarks he said (according to the *Scotsman*) that if unfeued lands suitable for feuing, and in demand, were taxed at an annual value similar to the price demanded by the landlord, the latter would not be so anxious to hold for exorbitant prices. After pointing out that the landlord contracted himself out of the paying of rates, Mr. Binnie stated that over and above that injustice they found duplicands and triplicands of feu-duty universal, while the taxing of singular successors, under the name of casualties, was carried on in a way that quite justified the term legal robbery. This system bore more directly, if not more heavily, upon the architectural profession and its ally the building trade than upon any other industry. Mr. Binnie thought some such action as the following might help to remedy the evil of the land monopoly:—1. The total abolition of casualties and duplications, triplications, &c. 2. The placing of the incidence of taxation beyond the sphere of contract, so as to make it impossible for the superior to shirk his duties to the State by contracting himself out of them. 3. The taxing of unfeued lands, contiguous to feued lands, at the same annual value, taking the price of feus last sold as the standard of value for the remainder. This would prevent the holding of lands for exorbitant prices without cost to the holder. 4. Existing contracts to run as at present till ownership changes, either by the death of the superior or by sale, and upon the registration of the change of ownership, let them come under the operation of the new law. 5. In cases where the superiority of lands is held by corporations, the superiors be allowed to enjoy the contracts as they stand for, say, fifteen years, and then let them come under the operation of the new law. Some such plan, he proceeded, would have a tendency to cheapen land, it would make taxation fall more fairly upon the various classes of the community, and would remove the temptation to hold lands long after their occupation was made necessary by the expansion of our cities for the purpose of forcing unreasonable terms upon the citizens.

ARCHITECTURAL SECTION OF THE PHILOSOPHICAL SOCIETY OF GLASGOW.—A meeting of the architectural section of the Glasgow Philosophical Society was held on the 2nd inst., Mr. James Thomson, President, in the chair. Mr. Francis H. Newbery, head master of the Glasgow School of Art, read a paper on "The Artist in the Architect." He reviewed the history of architecture with the object of showing that the architect of the past was not only greater than the painter or the sculptor, but that he often combined both. This was because his training in no wise differed from that of the others. Painting and sculpture had had, and still were having, constant recourse to nature, whereas architecture confined herself to tradition. Gothic architecture, he said, almost broke through this, but was restrained by Classic bias. When architecture could command votaries whose efforts had assimilated a knowledge of the figure as possessed by the Greeks, with an insight into floral ornament such as the Gothic builders had, then there would be evolved a new style of work. The study of the human figure ought to be the backbone of the architectural student's work, instead of as at present the copying of traditional forms and elements.

TRADE SMOKING CONCERT.—The Mutual Cycling Club (in connexion with Messrs. Colls & Sons' office staff) gave a smoking concert at the Surrey Masonic Hall on the 29th ult. The chair was occupied by Mr. W. A. Colls, who was supported by Mr. Ellis Marsland, Mr. W. Matthews, Mr. E. Brooks, and a large number of gentlemen connected with the building trade.

ARCHÆOLOGICAL SOCIETIES.

THE LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.—On the 30th ult. the annual meeting of this Society was held in Chetham's College, Manchester, Mr. W. E. A. Axon presiding. The annual report of the Council was read. It stated that the Society had completed its eighth year, and in every year there had been a steady increase in the roll of members. At the end of last year there was a total membership of 337. The motion for the adoption of the report having been agreed to, the election of officers for the year took place, with the following result:—President, Sir William Cunliffe Brooks, Bart., F.S.A.; Vice-Presidents, Mr. William E. A. Axon, F.R.S.L., and Principal Ward, M.A.; treasurer, Mr. T. Letherbrow; honorary secretary, Mr. G. C. Yates, F.S.A.

NEWCASTLE SOCIETY OF ANTIQUARIES.—The seventy-eighth anniversary meeting of the Newcastle Society of Antiquaries was held on the 28th ult. in the Castle, Newcastle, the Rev. Dr. Bruce presiding. The annual report of the society for 1890 was submitted, in which reference was made to the death of two of the society's oldest members, Mr. John Clayton and Mr. C. Roach Smith. Mr. Clayton's successor, it was stated, was about to build a museum at the Chesters, in which the abundant Roman remains would be more satisfactorily housed, and a full catalogue of the contents of the museum was in course of preparation. The report was adopted. Dr. Hodgkin said, with regard to the proposed publication of the "History of Northumberland," they had issued circulars and had received a good many responses, but not sufficient to enable them to go forward with publication.

Correspondence.

To the Editor of THE BUILDER.

ADJOINING OWNERS.

SIR,—Your able article on "Adjoining Owners under the Metropolitan Buildings Act," in your issue of January 31, must have been read with great interest by all architects, especially those who have to deal with, and work under, the provisions of the said Act almost daily.

In the course of my profession, I had to deal with the party-wall which was, later on, the subject of the action of "Fillingham *v.* Wood," but surely, to the practising architect, the decision of Mr. Justice Chitty opens no new ground! I have for years, when about to deal with a party-wall, carefully ascertained who are the adjoining owners in such wall, whose term is more than a yearly tenancy, and upon each and every one of these I have served a party-wall notice. Often in the case of a party-wall in the City of London, where the adjoining premises are let out in offices, this leads to a large amount of labour and expense (in one case lately, five notices were served with regard to the same wall).

I think, however, it is only just that a tenant, who holds "part of a tenement," even for three years only, should be allowed a voice in what may mean the laying open and re-building of the part of the premises in which he is interested.

My difficulty and objection in having to serve so many party-wall notices is in the next step, viz., the making of awards with several different adjoining owners. This I always try to avoid, if possible, by getting all of them to appoint the same surveyor to act for them, but if they were hostile to such a course, or their interests clashed, and they would not so act, I think the building owner might be under the necessity of making an award with each one separately, an expensive and by no means easy task.

An expression, however, upon this important point from your readers would be of much interest, and practically most useful.—Yours faithfully,

HOWARD CHATFEILD CLARKE.

63, *Bishopsgate-street, Within, E.C.*, Feb. 2, 1891.

SURVEYORSHIPS.

READING.—For the vacancy in the Borough Surveyorship, Reading, caused by the resignation of Mr. A. W. Parry, sixty-one candidates applied. The committee of selection chose from this number Mr. Martin (Bradford), Mr. Paton (Birkenhead), Mr. Collins (Weston-super-Mare), and Mr. Greenhill (Cardiff), who appeared before a committee of the Reading Council on the 28th ult. After a careful investigation, a vote was taken, the result being as follows:—Collins 16, Paton 10, Martin 7. As Mr. Collins had not a majority of the Council, another division was necessary, and this resulted in the election of Mr. Collins.

The Student's Column.

VENTILATION AND WARMING.—VI.

DOMESTIC VENTILATION.

IT is a matter of every-day experience that a considerable amount of fresh air enters the majority of rooms through the imperfect fitting of windows and doors, especially when exposed to the direct action of the wind. Nevertheless, the results of careful experiments to determine the precise amount of such ventilation are unfortunately lacking.

Such direct observations would be of especial value, because a theoretical investigation can only take account of recognised probabilities, and must, therefore, be deficient in data drawn from experience, the want of which must be supplied by inferential reasoning. Our inferences may possibly be somewhat erroneous, but in default of accurate observation, we must rely upon the assistance that theoretical calculation can afford.

In considering the subject theoretically, we can regard the open joints of any particular door or window as channels or means of communication between the external and internal air. The dimensions of these channels, of course, vary in each instance with respect to their size and arrangement, and the rate of flow will vary with the difference of pressure of the external and internal atmospheres, modified by the friction of the sides of the channels, which will naturally be comparatively of considerable amount, owing to the high proportion which the periphery of the cross section bears to its area. We can further regard the difference of air-pressure due to the difference of the internal and external atmospheres, and also due to external wind-pressure; and, ascertaining the extent of these for any particular instance, we can make our calculations based upon these data, just as we can make any other calculations for the flow of air from an atmosphere of greater pressure to one of lesser intensity.

A considerable proportion of the ventilation caused by our open fireplaces has, undoubtedly, as its fresh-air inlet, the imperfect joints of doors and windows. This, from the rapidity of the current, as well as the inevitable lowness of external temperature, which, of course, coexists with the use of a fire, lead to the production of draughts. Very much of the draught thus produced may be avoided by adopting some of the precautions we have noted in a previous chapter to this particular case.

By enlarging the collective area of our inlets, we at once diminish the rapidity of current; by subdividing them, we break up the current; and by giving an upward direction, we divert it from inconvenient proximity to our persons.

Various expedients have been suggested and adopted to attain these ends. Thus, for example, the well-known device adapted to double-hung sashes of a shallow board fixed between the beads at the bottom of the lower sash. Then the lower sash being raised, a considerable opening is formed between the meeting rails and a smaller one between the bottom rail and the shallow board. Through these the air enters at a slow rate, and with an upward direction, so that not only is the ventilation improved by the reduction of frictional surface, but draught is lessened by decrease in the rapidity of current of the incoming fresh air.

Of a similar nature are Currall's ventilators, made for insertion into the rail of a sash or of a door. Various forms of inlet boxes for building into a wall have also been introduced for the same purpose, which have the further advantage that means of filtering the incoming air, a very necessary consideration in dealing with the atmosphere of a smoky town, can be readily combined.

These and similar expedients are, perhaps, the best that can ordinarily be introduced for the ventilation of domestic buildings, wherein, by reason of the initial expense and the difficulty of maintenance of artificial ventilation, save of the simplest form, we are usually limited to some form of natural ventilation, despite its manifold disadvantages.

We have already referred to the operation of an open fire as contributing to ventilation. The creation of a considerable column of heated air in the flue is, of course, accompanied by a movement of air, from the difference of atmospheric pressure within the flue and without the building. Tested with an anemometer, we ordinarily find the rate of flow within the flue to vary from 3 ft. to 6 ft. per second. The multiplication of these figures by the sectional area of the flue,

gives us at once the cubical amount of ventilation which is being effected.

Taking the ordinary size of a flue at 14 in. by 9 in., it will be at once seen that the amount of ventilation thus produced is not great, and even when assisted by diffusion through the enclosing walls, ceilings, and floors, sufficient only for ordinary cases, in the absence of artificial lighting, other than the electric light.

When the rooms of a dwelling-house are fully occupied, as in the case of a dinner-party or an "at home," or when the rooms are lit up by the ordinary gas-burners, further ventilation than that afforded by the fireplace is necessary.

The best method of effecting this extra ventilation will vary with circumstances. It is as absolutely impossible to prescribe one particular method or "system" of ventilation which shall be applicable to all cases as to prescribe one particular drug which shall prove an infallible panacea for all bodily ailments. Such a procedure as this in medicine is now generally recognised as sheer quackery. In ventilation it is equally sheer quackery to assert that any one "system" is always and infallibly the best.

To increase the extent of domestic ventilation, various forms of valve ventilators have been designed for insertion in chimney-flues. These are always liable to the possibility of smoke escaping into the room from them, and are, besides, of small efficiency in adding to the extent of the ventilation. They have this advantage, that the foul heated air at the upper part of the room is carried off at a high level, instead of being brought down to the level of the fireplace opening, as would otherwise be the case. In this way, the apparent improvement they effect in the atmosphere of the room is caused, and, so far, their operation is valuable.

It is, however, far better to provide an extra flue for the insertion of such ventilators, and thus avoid the probability of leakage of smoke while, at the same time, providing additional outlet capacity.

The increase of temperature which invariably attends the vitiation of air by a larger number of occupants, and still more than of artificial lighting, furnish us with a means of air movement which, for domestic ventilation, is invaluable.

Frequently, the provision of an extra flue, carefully protected from reduction of temperature, together with corresponding additional inlets, carefully arranged to minimise the production of draught, will, by reason of the increased temperature of the vitiated air, be sufficient to largely augment the amount of ventilation.

Further activity of atmospheric change can easily be arranged for by warming the additional flue or flues, or by utilising any other reliable method of producing air movement. Sometimes water-power may be obtained to work a small fan, sometimes wind pressure may be utilised, sometimes some other source of power.

As a general rule, admitting, of course, of occasional exceptions, a central system of ventilation for domestic purposes is not advisable. The varied requirements of the room, the partial nature of their occupation, all combine to make individual arrangements for each far preferable and far more easily managed than a combined system with central action.

We have taken it for granted, in considering domestic ventilation, that a fire is burning in the room needing ventilation. At those periods of the year when a fire is not burning, undoubtedly the best method of producing ventilation in domestic buildings is to open the windows.

OBITUARY.

MR. JOHN DIXON, C.E.—On the 28th ult., Mr. John Dixon died at his residence, High Towers, East Croydon, aged 56. Mr. Dixon will be remembered as the engineer who undertook the transport of Cleopatra's Needle from Alexandria to the Thames in 1877. He was the nephew of the late John Dixon, the first chief engineer of the Stockton and Darlington Railway. He was born in Newcastle in 1835, says the *Newcastle Chronicle*, and after serving an apprenticeship at the Engine Works of Robert Stephenson & Co., he was appointed engineer and manager at the Bishopwearmouth Iron Works of the Consett Iron Company. He soon after removed to London, where he began a successful career as engineer and contractor, which was continued till his death. In this capacity he carried out many important works in various parts of the world, commencing with the landing stages on the Thames Embankment, piers at Southport and Douglas, Isle of Man, and large iron piers and wharves at Huelva, in Spain, for the Rio Tinto Company. A bridge over the Nile at Cairo was his next work, followed by extensive drainage and sanitary works at Rio Janeiro, and piers in Mexico and Para on the Amazon. About 1874, in connexion with Mr. Richard Rapier, he got the concession for, and made the first experimental railway in China, from Shanghai to Woosung. He also discovered an unexpected supply of water in the Rock of Gibraltar. His next enterprises were in Portugal, where he constructed the Custom House Piers at Lisbon, and a sixty-mile line of railway, for which he was awarded by the late King an Order of Merit. Bridges at Waterford in Ireland, and docks and harbour extensions at Port Talbot, in Wales, occupied him for some time, and almost his last important work was the re-building of Hammersmith Suspension Bridge over the Thames, for the Metropolitan Board of Works. Mr. Dixon was some years ago accorded by the University of Durham the degree of M.A. (*honoris causâ*). He was also a Lieutenant of the City of London. On the 2nd inst. his remains were interred at Shirley Church, near Croydon.

HERR NIKOLAUS YBL.—The death is recorded, at Pest, of Nikolaus Ybl, the most eminent of Hungarian architects. The deceased was 77 years of age. He studied at Vienna, followed his profession for some time at Prague, and for the last fifty years resided at Pest, where he designed many remarkable buildings, amongst them being the Opera House, the Custom House, and the Karolyi Palace. His latest works were the completion of the Leopoldstadt Basilica, and the Castle of Ofen (Buda).

MR. HENRY OLDHAM.—On the 1st inst., Mr. Henry Oldham, contractor, of Accrington, and a member of the Town Council, died at the age of forty-four. He was extensively engaged in the building trade.

MR. T. WILKES WEBB.—The death is announced of Mr. T. Wilkes Webb, of the firm of Thomas Webb & Sons, Limited, Dennis Works, which occurred somewhat unexpectedly on the 21st ult., at his residence, The Mount, Stourbridge. Mr. Webb was only fifty-four years of age; but he entered upon business early, and his connexion with the works at Dennis have extended over forty years. When he entered his father's office and works about the year 1850, the condition of affairs in the flint glass trade was very different from what it is now. The application of art to manufactures of all kinds in England was then in a very backward state, and this was as obvious in the glass industry as in any other. The firm of which,—before it became a limited company,—Mr. Webb was the ruling and guiding spirit, attained a high reputation for its artistic products, especially in cameo, engraved, and enamelled glass.

GENERAL BUILDING NEWS.

THE NEW ADMIRALTY BUILDINGS.—We have had an opportunity of inspecting the foundation-works for the new Admiralty buildings in St. James's Park, close to the Spring-gardens entrance. The contract for the superstructure (for which Messrs. Leeming & Leeming are the architects) has not yet been entered into, so that all that is apparent inside the hoarding is a huge excavation, some 324 ft. long by 134 ft. wide (outside measurements), and averaging 17 ft. in depth. This deep cutting is now lined with a very massive concrete wall, 17 ft. 3 in. thick at the level of the lower bench or step, and gradually diminishing by successive steps or sets-off as it goes upwards, until it is about 4 ft. wide at the ground level. Upon the top of this concrete wall will rest the main external walls of the superstructure. The whole bottom of the area excavated is also being covered with a thick bed of concrete. The contractor for the whole of these works is Mr. William Webster. Much difficulty has been experienced with the water with which the subsoil here is heavily charged. To prevent it from penetrating the concrete work, the whole of the external faces of the retaining wall (*i.e.*, the faces against which the earth will abut) are covered with Claridge's asphalte, applied in pieces about 18 in. by 12 in., *à la* armour-plating, the joints being V-grooved and tongued, and filled in with liquid asphalte, so as to make one homogeneous whole of the protective asphalte coating, which is ¾-in. thick, and is connected with the asphalte damp-course which passes under the footings of the wall and under the whole of the basement area. It makes a very neat and effective job, and is an interesting exemplification of the capabilities of Claridge's asphalte.

THE ROYAL ENGLISH OPERA HOUSE. — Mr. D'Oyly Carte's new theatre in Shaftesbury-avenue, of which we gave a few particulars last week (see p. 93, *ante*), was opened with *éclat* on Saturday evening last, with the new opera *Ivanhoe*, composed by Sir Arthur Sullivan. The acoustic properties of the building appear to be, by all accounts, satisfactory in all parts of the house. From want of space and other unavoidable causes we are obliged to hold over our promised detailed description of the building until next week.

POOR-LAW SCHOOLS, CANNOCK.—The Cannock Board of Guardians have lately had completed a block of buildings to accommodate fifty boys and forty-eight girls, from plans, &c., prepared by Mr. J. R. Veall, of Wolverhampton, architect to the Board. The accommodation provides day-rooms and dining-hall for boys and girls, sewing-room, two bath-rooms and lavatories, with dormitories for ninety-eight children in single beds, all cheerfully lighted and well-ventilated. A Trainer's sitting and bed-room, scullery, stores, earth-closets, and other conveniences are also provided. The floor of the dining-hall and day-rooms are laid with the Wood Block Flooring Company's patent flooring; hot and cold water are laid on to the baths, lavatories, &c., and gas is fitted throughout the wards. Spacious playgrounds for each sex are provided with covered sheds, and latrines in each yard, which are laid with "Melsom's" tar and granite-chipping asphalte. The whole of the works have been carried out by Messrs. Dorse & Son, contractors, Cradley Heath, at a cost of 2,214*l.*, under the superintendence of the architect.

NEW ROYAL ASSEMBLY HALL, SOUTH SHIELDS.—The new Royal Assembly Hall, South Shields, has just been finished. The building is situate in Stanhope-street, at the rear of the Royal Hotel, with which it is connected by covered bridges and corridors. The principal elevation is in the English Renaissance style of architecture. Normandy bricks and Hebburn stone dressings have been used in the exterior walls. An entrance-hall or crush-room forms the first apartment, and on either side are cloak-rooms. From the crush-room there are corridors leading to the reserved seats of the hall. The hall is 120 ft. long and 60 ft. wide. At the end nearest the entrance are the platform and orchestra. This part is covered with a domed ceiling, and artists' dressing-rooms are provided beneath the orchestra. A gallery is situated at the opposite end of the building. The total accommodation of the hall will be nearly 2,000 people. The ceiling is in the form of a barrel vault, intersected by semi-circular groins, springing from pilasters, and all the interior decorative work is executed in fibrous plaster by Mr. G. G. Laidler, of Newcastle. The flooring of the hall is laid with hard wood. On the basement of the premises there is another hall. The building has been lighted with electricity by Messrs. R. J. Charlton & Co., of Newcastle. Provision has also been made for gas-lighting; this, with the plumbing and sanitary work, having been done by Mr. John Dagleas, of South Shields. The building is heated by steam coils, fitted by Messrs. Dinning & Cooke, of Newcastle. Cathedral tinted glass has been used for glazing the windows, screens, and doors. Messrs. Middlemiss Brothers, of Newcastle, were the general contractors for the work, which was designed and carried out under the superintendence of Mr. J. H. Morton, architect, of South Shields.

CHURCH, KILSYTH.—The plans of Mr. Petrie, Glasgow, have just been adopted for the proposed United Presbyterian Church, Kilsyth, N.B. The church will be seated to hold 658, with a large hall attached. The total cost of church, hall, and other offices is estimated at 2,500*l.*

NEW CHURCH, LLANDAFF YARD.—On the 28th ult., the church of All Saints', Llandaff Yard, was consecrated by the Bishop of the Diocese. The church is designed in the fifteenth century style of architecture, and accommodates about 300 people. It consists of a nave, 51 ft. by 25 ft.; a choir, separated from the nave by a large open arch; and the chancel, also separated from the choir by an arch. The vestries and organ chamber are formed out of the quasi-transepts by open screens. A tower is formed at the south-west angle. The church is built of Pontypridd stone, with Bath stone dressings. The seats, roofs, screens, &c., are all of pitch pine, the lectern and altar being of oak. The pulpit is of coloured stone, with alabaster bands and a niche formed for a figure in front. The floors of the chancel and choir are laid with marble inlay in cement (patented by Mr. J. Hartnell, of Cardiff). The font is also of coloured stone. The centre light of the east window represents the Crucifixion, and the two east choir windows are filled with figures of St. John and St. Peter. These are by Messrs. Savell & Co., London. The work has been executed by Messrs. W. Thomas & Co., Cardiff, from designs and under the supervision of Messrs. Kempson & Fowler, architects, Llandaff.

MATHEW CENTENARY HALL, DUBLIN.—A new Temperance Hall, erected in Church-street, Dublin, to the memory of Father Mathew and his work, has just been opened. The hall is 75 ft. in length by 39 ft., with a height from floor to ceiling of 35 ft. The ceiling is covered with pitch-pine framing. A gallery runs around two sides of the hall, and extends half way from the back to the centre of the hall. The front of the gallery is panelled. The stage is a large one, and underneath are dressing-rooms, with entrances from both sides of the building. At one side of the entrance is a coffee-bar, and over that a reading-room and a billiard-room. In the upper storey are the caretaker's rooms, as well as some store rooms. Under the hall there is a large space, which is to be fitted up as a temperance refreshment-room. The work has been carried out by Messrs. Kelly & Sons, of Dublin, from the designs of the architect, Mr.

Walter Doolin, Dublin, and under the supervision of Mr. Patrick Barry, the clerk of works.

PROPOSED NEW CHURCH, LIVERPOOL.—At a Consistory Court, presided over by Chancellor Espin, and held in St. Nicholas's Church, Liverpool, on the 27th ult., the Rev. Thomas Dickson, incumbent of Christ Church, Waterloo, and the churchwardens applied for a faculty authorising them to take down the old church and erect a new one on the same site. The new church would accommodate as many persons as the old. It was considered that the roof of the old church was insecure, and its reconstruction was deemed necessary. Permission was also asked to allow the church authorities to provide a temporary place for holding Divine service in by an addition to the north transept of the old church while the new church was being built. The cost of the work that was to be started at once would be 6,000*l*. After scrutinising plans and drawings connected with the new church, the faculty was decreed in the terms of the citation.

SANITARY AND ENGINEERING NEWS.

NEW BRIDGE AT PENSHER.—On the 29th ult. a new bridge over the Wear at Pensher was opened for public use by the Earl of Durham, Lord-Lieutenant of the county of Durham. The total cost of the bridge and approach roads is about 8,000*l*. Messrs. Head, Wrightson, & Co., Stockton-on-Tees, have been the contractors for the bridge structure, and Mr. John Carrick, of Durham, for the approach roads, Mr. L. Hudson, jun., Sunderland, being the sub-contractor for the masonry, piling, and bridge roadway. The engineer for the bridge works was Mr. D. Balfour, M.Inst.C.E., F.G.S., and the clerk of works Mr. W. T. Fowls. The foundations consist of concrete overlying a pitch pine double platform supported on 12 in. piles driven to the depth of 25 ft. under the river bed into the hard shale. The abutments are of large rock-faced ashlar, with main pillars 12 ft. high adjoining the approach parapet walls, the stone being supplied by the Whitburn Coal Co. from their Marsden Quarries, near South Shields. The iron structure consists of two curved main girders of wrought iron, each 155 ft. long, resting on large bed stones. Each girder has the upper and lower booms braced by vertical struts and diagonal ties, having three overhead lattice bracings for wind pressure. The flooring consists of cross girders 12 ft. apart, overlaid with longitudinal corrugated iron troughing, covered with a bed of concrete and a finished surface of whinstone, tar, and macadam, steam rolled. The net span of the bridge is 145 ft., and the clear width of the carriageway and approach footway is 22 ft., and the net height of the bridge above high water-mark is 20 ft., as required by the River Wear Commissioners.

PROPOSED SEA-WALL PROMENADE AT FILEY.—On the 27th ult., at the Local Board Offices, Filey, Mr. Arnold Taylor, Local Government Board Inspector, conducted an inquiry with respect to an application by the Filey Local Board for compulsory powers to acquire lands otherwise than by agreement for the construction of a proposed sea-wall promenade. Mr. Luke White (Driffield), the solicitor to the Local Board, said that that body some years ago contemplated the erection of a sea-wall at Filey, and that evidence was then given at a Local Government Board inquiry which was held, which showed that such a wall and promenade were absolutely necessary for the protection of property from the incursion of the sea.—Mr. W. N. Maley (chairman of the Filey Local Board) said that if the proposed works were not done, it would only be a question of how many years would elapse before the town, or at least the part of it in question, would be washed away entirely, and it was necessary that the land adjoining the proposed sea-wall promenade should be acquired for the purpose of laying it out as gardens, so as to increase the attractions of the town as a health and pleasure resort. The Inspector intimated that he would report the result of the inquiry to the Local Government Board.

FOREIGN AND COLONIAL.

FRANCE.—The Minister of Instruction and Fine Arts has presented to the town of Elbeuf a very interesting archæological collection containing some unpublished documents on the history of France, especially the records of the Abbey of Cluny and the Cathedral of Grenoble.——The jury in the competition for the monument to General Lariboisière at Fougères have awarded the execution of the work to M. G. Recipon (sculptor). The first premium has been given to M. Gilbert (sculptor), the second to MM. Desca and Meugin (sculptors), and M. Pierre Gélis-Didot (architect). Other medals and honorary mentions have been awarded to other competitors.——The jury in the competition for a Salle des Fêtes for the town of Séthune have given the first premium to M. Conil-Lacoste, the second to M. Courtois-Suffit, and the third to M. A. Agnès. ——The sudden death, at Bordeaux, is announced of M. Durand, of that city, architect among other works of the Hot Baths establishment at Cauterets in the Pyrenees, and of the synagogue and the new building for the Facultés des Lettres et Sciences. He was born at Bordeaux in 1824. He joined in 1876 the Société Centrale, of which he was an active member.——The Government intends to commission M. Bonnat to execute the allegorical painting for the ceiling of the principal chamber of the Civil Tribunal at the Palais de Justice of Paris. ——The Museum at Dijon is to be enlarged by the addition of three new sculpture galleries. There is also to be a gallery built for the collected works of Rude, the sculptor, which are at present dispersed in various parts of his native town. ——The church at Ermont, which has been recently completed, is to have five decorative panels painted by M. Albert Maignan. The subjects are the Virgin and child and two angels, on the three centre panels. The other two panels will have floral decorations in mosaic.——The Municipal Council of Bagueux has decided to proceed with the restoration of the church there, which is classed under the "Monuments Historiques." It is a curious edifice dating from the twelfth and thirteenth centuries.——M. Debon has been commissioned to execute some decorative panels for the Mairie of Charenton-St.-Maurice, consisting of views in the suburbs of the city.——M. Galland has completed his paintings in the fifteen cupolas of the ceiling of the gallery running along the salons à arcades in the Hôtel de Ville at Paris. He has painted these with allegorical representations of the principal Paris trades. The gallery was to be opened to-day (February 7).——M. Chaplain has been commissioned to execute the marble bust of the Republic for the Lycée Buffon, recently built on the Boulevard de Grenelle from the designs of M. Vaudremer.

COLOGNE.—Last year the new bronze doors of the west entrance of the Cologne Cathedral were hung. The first bronze door of the south entrance has now been placed in position. This portal, like the others, has been designed by Professor H. Schneider, of Cassel. Considering their weight (1,500 kg.) and their height (4 mètres), the doors swing very easily, the wings having been hung on ball-bearing hinges. —*Deutsche Bauzeitung.*

DRESDEN.—The valuable collection of casts which has been found room for in the lately-finished "Albertinum" buildings has now been opened to the public. The arrangement of the Olympia groups deserves special attention.

WIESBADEN.—A new Court Theatre is to be erected at a cost of some 1,800,000 marks. The following architects, Professor Frentzen (of Aachen), Herr Semper (of Hamburg), and Messrs. Hellmer & Fellner (of Vienna), all theatre specialists, are to be invited to send in designs.

BERLIN.—At the official celebration of the Emperor's birthday at the Royal Technical College, the Rector for 1890-91, Professor Reuleaux, gave a lecture on the advance of German industry and the advantages of Berlin carrying out the proposed Universal Exhibition scheme so long spoken of. At the University celebration the archæologist, Professor Curtius, spoke on Hellenic art. At the Prussian Royal Academy the Emperor was honoured as a friend to the freedom of art in a commonplace patriotic harangue by Professor Dobbert.——The illuminations on the evening of the Emperor's birthday showed the advance electricity has made in the capital of late years. Large commercial establishments framed the architectural outlines of their buildings with incandescent lights; smaller establishments electrified their patriotic emblems. The Electricitäts Gesellschaft informs us that their works alone had to supply current on this occasion for over 30,000 extra lights, besides for the 6,500 extra ones with which they had illuminated the imposing façade of their new offices.——The Emperor has had a miniature railway station built for himself in close proximity to his Potsdam Palace-grounds on the Berlin-Potsdam line.

MISCELLANEOUS.

THE NATIONAL REGISTRATION OF PLUMBERS.—A public meeting was held on the 29th ult. at the Municipal Buildings, Southampton, under the presidency of the Mayor, to elect a District Council to carry out the national training and registration of plumbers in Southampton and district. The Council elected consisted of eight master plumbers, eight operative plumbers, and eight public representatives—the last including the Mayor, the Sheriff, Mr. Alderman Barford, Dr. Aldridge, J.P., Dr. Harris (Medical Officer of Health), and Mr. Morris Miles (Chairman of Council of the Hartley Institution). A deputation from the Worshipful Company of Plumbers, London, was present, consisting of Mr. Alderman Knill (Past Master), and the Clerk.——A public meeting, convened by the Leeds District Council in connexion with the movement for the national registration of plumbers, was held on the 30th ult., at the Philosophical Hall. There was a large gathering, composed largely of master plumbers, journeymen, and apprentices. Mr. J. W. Connon, F.R.I.B.A., President, was in the chair. The first annual report of the District Council, read by the Hon. Sec. (Mr. W. Braithwaite), stated that the movement for the national registration of plumbers, initiated by the Worshipful Company of Plumbers, had spread widely and rapidly. The District Registration Committee had considered 370 applications for registration from all parts of the county, and the result had been the registration of 160 master plumbers and 171 operatives. Of the fifteen persons asked to present themselves to the Examination Committee for examination, eight offered themselves, only three of them, however, being successful. In future, all candidates for registration who had not for some time been in the trade would have to submit to examination. Through the kindness of the Council of the Leeds School of Science and Technology, a class had been formed for instruction in the theory and practice of plumbing.

DISPOSAL OF THE DEAD AROUND LONDON.—At the weekly meeting of the Balloon Society of Great Britain, on the 30th ult., at St. James's Hall, Sir F. G. Milner, Bart., M.P., in the chair, a paper was read by the Rev. F. Lawrence, Hon. Sec. to the Church of England Burial, Funeral, and Mourning Reform Association, on the above subject. The lecturer said that the present condition of most suburban cemeteries had its origin in the introduction of the use of a coffin in Charles II.'s time. Previously, the dead had been buried in a linen or woollen shroud. The parish coffin used to be taken to the house of the dead, into which the corpse was placed and taken out for burial. At the grave side the body was laid into the earth without the coffin; earth was cast upon the body, not upon the coffin. The earth played the part of a slow crematory. Before the same grave was needed for another burial its former occupant had passed completely away. The use of a coffin had altered all this. The coffined bodies of the dead were now doomed to generate poisonous gases, which no hermetical sealing could restrain, and which generations hence might find their way as the avenging angels of violated nature. The remedy lay in a return to the old paths. The coffin must be perishable. The soil must be suitable and sufficient. The Legislature should intervene with a view to—(*a*) The more effectual protection of the public against the danger arising from the further general use of already overcrowded burial-places. (*b*) The more frequent inspection and more thorough supervisions of all burial-grounds. (*c*) The prevention of overcrowding by more stringent regulations. (*d*) The provision where necessary of properly appointed mortuaries. (*e*) The more accurate certification of the cause of death. (*f*) The securing proper earth for a cemetery before it be so used. Resolutions in support of these propositions, and calling upon the Government to close all the cemeteries in the Metropolis and transfer them to the London County Council for maintenance as open spaces, were carried, after an animated discussion.

THE ENGLISH IRON TRADE.—There is little animation in the English iron market, both consumers and producers showing great reserve. The moderate business which is taking place refers only to immediate wants. At the same time, although prices are easier, ruling quotations are fairly well adhered to, taking the trade all round. The fact is that buyers are expecting still lower values to prevail shortly, for what reason we are unable to perceive, seeing that raw materials and fuel keep comparatively high, while sellers hope much from the coming Spring trade, and consequently are disinclined to bind themselves forward. The Glasgow warrant market has been steady, with but a small business doing. Cleveland pig is 6d. a ton lower for prompt contracts, but firm forward. Hematite pig is practically unchanged. Finished iron is still quiet, owing party to the backwardness of users in placing orders, but partly to the unwillingness of manufacturers to budge as to prices. Sheets, however, have receded another 2s. 6d. a ton in Staffordshire, which makes them 10s. lower than at the beginning of the year. The tone of the steel market is weak, and most steel products are quoted this week 2s. 6d. a ton below the rates ruling a week ago. But as the wants of consumers, notably shipbuilders, must be met shortly, the downward tendency of the market ought to be arrested. The shipbuilding trade is still fairly well employed, and may be brisk again before long, as fresh orders for ships are in view. Most branches of the engineering trade keep active.—*Iron.*

A HUGE STEEL STRUCTURE.—The new Masonic Temple at Chicago, for the supply of structural steel of which a contract has just been obtained by the Columbia Iron and Steel Company, Pittsburgh, will be a building twenty stories high, the chief feature of which is a skeleton of steel, round which the masonry will be built. The building will measure 113 ft. by 170 ft. in plan, and will rest on a foundation of steel rails. The steel work will weigh between 3,500 and 4,000 tons, and will be made at Pittsburgh ready to be put together without any alterations. Every piece will be exactly fitted, holes drilled, connexions dovetailed, and all details adjusted, so that the work of erecting the skeleton can be proceeded with with celerity. In fact, the entire work of erecting the steel structure may be completed before the masons and bricklayers begin their part of the work. The contract for the steel has been taken at 300,000 dols., and the whole building is estimated to cost 2,000,000 dols.

ENGLISH SCULPTURE IN AMERICA.—Mr. Bruce Joy, the sculptor, has been gaining a great deal of praise in New York for a collection of his works which has been exhibited there.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Decoration of Concert Room	Liverpool Philharmonic Society	50*l.* 25*l.* and 15*l.*	Mar. 7
*New Municipal Offices, and Art, Science, and Technical Schools	Rochester Corporation	15*l.* 15s. 10*l.* 10s. & 5*l.* 5s.	Mar. 21
*Covered Market, Arcades and Shops, Halifax	Markets and Fairs Committee	100*l.* 50*l.* and 30*l.*	May 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*New Hospital, North Heigham	Norwich Corporation	P. P. Marshall	Feb. 10
Water Mains, Fittings, &c. Dynas Powis	Cardiff U.R.S.A.	W. Fraser	do.
Cast-iron Sleepers, Wheels, Axles, &c.	India Office	*Official*	do.
*Silicated Stone Pipe Sewer	East Ham Local Board	W. H. Savage	do.
Bridge Work, Station Fittings, &c.	South Indian Ry. Co.	*Official*	do.
Roadmaking and Fencing, South Winton	South Coast Freehold Land Society	Hankinson & Lane	Feb. 11
*Additions, &c. to Eastern Fever Hospital	Met. Asylums Board	Keith D. Young	do.
Pair of Semi-detached Villas, Ripon	W. Wells	G. Mallinson	do
New Passenger Station, Hebden Bridge	Lanc. & Yorks. Ry. Co.	*Official*	do.
Sewer Ironwork, &c.	St. Luke's Vestry (Middlesex)	do.	do.
*Sewer and Drainage Works	St. Saviour's Bd. of Wks	do.	do.
*Swimming Bath	Hackney Union	do.	do.
Public Hall and Workmen's Institute, Ynyshir, Rhondda Valley	Ynyshir & Wattstown Public Hall Co. Lim.	Chas. Taylor	do
Aërated Water Factory, Trealaw	Rhondda Valley Aërated Water Co. Lim.		Feb. 12
School, Craighill-road	Leith School Board	George Craig	Feb. 13
Work at Parish Church, Willington, co. Durham		J. Allison	Feb. 14
*Works, Materials, &c.	Hendon Local Board	S. S. Grimley	Feb. 16
*70 to 80 Small Houses, &c. Sheerness-on-Sea	Messrs. A. E. F. England and Others		do.
Rebuilding House, Gloucester	H. T. Theobald & Co.	J. Fletcher Trew	do.
*Cleansing, &c. and Keeping in Repair, Southwark Bridge	Committee for Letting Bridge House Estates	*Official*	do.
Removing Bridge over Clyde at Dalmarnock	Bridge Committee	Crouch & Hogg	Feb. 17
Excavating, Levelling, Fencing, &c. Recreation Grounds, Tredegar, Mon.	Ed. Morgan		do.
Granite and Flint Road Metal	Rochester Highway Bd.	*Official*	do.
*Paving Stone	Dover Town Council	do.	do.
Public Hall and Caretaker's Cottage, Crickhowell	Public Hall Co. Lim.	E. A. Johnson	do.
*New Municipal Buildings	Sheffield Corporation	E. W. Mountford	do.
*Roadmaking Works	Brentford Local Bd.	J. H. Strachan	do.
*Paving and Sewering Works	Chiswick Local Board	Mr. Ramsden	Feb. 18
*Works and Materials	do.	do.	do.
*Road Materials, &c.	County Borough of St. Helen's	G. J. C Broom	do.
*Road Works	do.	do.	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	do.
*Laying Asphalte	do	J. P. Norrington	do.
Stabling, Covered Yard, and House, Albert Mills, Halifax		John Drake	do.
*Masons' and Paviors' Work	Westminster Vestry	G. R. W. Wheeler	do.
Water Supply Works, Bagnall	Stoke-on-Trent R.S.A.	J. Beardmore	do.
New Infirmary and other Works	Pershore Union	Geo. Hunt	Feb. 19

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Works and Materials	St. Marylebone Vestry	*Official*	Feb. 19
*Broken Stone, Footway, Yorkshire, &c. Paving	do.	do.	do.
Presby. Chapel, Mt. Pleasant, Ebbw Vale	Mr. Mortimer		Feb. 20
*Alterations and Additions to Infirmary	Salisbury Infirmary	J. Harding & Son	do.
Electrical Communication at Asylum	Stafford Asylum Com.	*Official*	do.
*Works, Materials, &c.	Surbiton Impt Com.	do.	Feb. 21
New Club House	Lyndhurst Workmen's Club, Lim.		do.
Alterations and Additions to Schools, Coedpenmaen	Eglwysilan Sch. Bd.	Thos. Rowland	do
*Works, Materials, &c.	Kensington Vestry	*Official*	Feb. 24
*Public Conveniences, &c. Clissold-park	LondonCountyCouncil	do.	do.
*Waterworks, Teversal	Mansfield U.R.S.A.	G. Hodson	do.
*Works and Materials	War Department	*Official*	Feb. 25
Gasholder Tank	Stockton-on-Tees Corp.	do.	do.
*Road Works	Witham Local Board	C. Pertwee	Feb. 26
*Foundation Works, Asylum	Dorset County Lunatic Asylum	G. F. Hine	do.
*Building Materials	War Department	*Official*	Mar. 1
*Gasfitters' Works	Com. of H.M. Wks, &c.	do.	Mar. 2
46 Villas and Cottages, Two Shops, &c. Barry	Park (Barry Dock) Building Co. Lim.		W. H. Dashwood Caple	do.
New Church, Knocknimny, co. Fermanagh	Rev. Jas. O'Reilly	W. H. Beardwood	Mar. 4
*Works and Repairs to Public Buildings in London	Com. of H.M. Wks, &c.	*Official*	Mar. 5
*Chimney at Northfleet		Mr. Bates	No date
Two Houses, Burley Hill, Leeds		J. Evers	do.
Two Houses, Manston, Crossgates		do.	do.
Eight Houses, Wortley, Leeds	Joseph Thornton	F. W. Rhodes	do.
New Premises, Skinner-street, Newport, Mon.		Habershon & Fawckner	do.
Alterations, &c. to Fent Stores, Carlisle		H. H. Hodgkinson	do.
Eight Houses, Wylam-on-Tyne	William Yeats		do.
*Sewer's Works, Trees, Making-up and Paving Footways, &c.	Shirley House Estate, West Ham	Jno. Hudson	do.
*Various Works, Kidsgrove, Staffs.	Clough Hall Park, &c. Co. Lim.	Jas. Stevens	do.
*Alterations, &c. to Public Buildings, Redhill	Redhill Market Hall Co.	Clayton & Black	do.
*New Premises, Devizes	Wilts & Dorset Banking Co.	G. M. Silley	do.
Chimney Stack (150 ft. high), Deepcar, Yorks	J. Gregory & Co.		do.
Alterations to Railway Hotel, Lancing, Sussex	G. F. Eden	R. A. Came	do.
Concrete Cover to Reservoir	Scarborough Corp	Mr. Millhouse	do.
23 Houses, Woodside, Horsforth		Fairbank & Wall	do.
New Institute, Derby	Young Men's Christian Association	Habershon & Fawckner / Naylor & Sale	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Second-class Assistant Surveyors	Civil Service Com.	Not stated	Feb. 6
*Clerk of Works	Daventry Town Coun.	2*l.* 10s.	Feb. 14
*Clerk of Works	Oldham School Board	Not stated	Feb. 16
*District Surveyor	Nantwich High. Bd.	120*l.*	do.
*Surveyor	Stroud Local Board	150*l.*	Feb. 18
*Assistant in Surveyor's Office	St. Marylebone Vestry	120*l.*	do.
*Surveyor	Bilston Township Com.	150*l.*	Feb. 24

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx. *and* xxi.

LECTURES AT CARPENTERS' HALL.—The Worshipful Company of Carpenters announce a course of free lectures on "Matters connected with building," to be delivered at their hall, London-wall, at eight o'clock, on Wednesday evenings from February 11 to March 18. We gave a list of the lectures in the *Builder* for January 24, p. 76.

A LECTURE ON STAINED-GLASS WINDOWS.—At the Art Club, Upper Parliament-street, Liverpool, on the 2nd inst., Mr. C. W. Whall, of London, read a paper on "Stained Glass." The lecturer described and illustrated the working of a stained-glass window from its primary conception, and also performed in the presence of the audience the operations of cutting, tracing, and painting the glass, and described those of leading, firing, &c. Adverting to the resources of stained glass as a decorative material, Mr. Whall strongly condemned the attempts to produce realistic pictures in it. He deplored the extent to which the cheapness of stained glass, and the dangerous facilities of its production caused it to be used, to the abandonment of sculpture, fresco, and other noble means of decoration. The lecturer gave several hints for the guidance of those who might at some future time have something to do with the erection of stained glass or of any form of decoration. Mr. Whall concluded his observations with a regret that he had not been able to draw an entirely flourishing picture of stained glass as it is, but pointed out, with some hope for the future, the manner in which the various arts of architecture, painting, and sculpture were drawing closer together at the present time.

MEETINGS.

SATURDAY, FEBRUARY 7.

Royal Institution.—Mr. W. Martin Conway, M.A., F.S.A., on "Pre-Greek Schools of Art." III. 3 p.m.

Association of Public Sanitary Inspectors.—Annual Dinner. Holborn Restaurant, 6 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." I. 4.15 p.m.

MONDAY, FEBRUARY 9.

Clerks of Works' Association.—Eighth Annual Dinner Holborn Restaurant, 6.30 p.m.

University College (Archæology).—Mr. W. St. Chad Boscawen on "Babylonian Archæology and Art." IV. 5 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Drainage." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. A. J. Hipkins, F.S.A., on "The Construction and Capabilities of Musical Instruments." III. 8 p.m.

TUESDAY, FEBRUARY 10.

Institution of Civil Engineers.—Discussion on Messrs. Llewelyn B., and Claude W. Atkinson's paper on "Electric Mining Machinery." 8 p.m.

Society of Arts (Applied Art Section).—Mr. Heywood Sumner on "Sgraffito." 8 p.m.

Birmingham Architectural Association.—Mr. H. O. Cresswell on "Sketching and Measuring." 7.30 p.m.

WEDNESDAY, FEBRUARY 11.

South Kensington Museum (Lecture Theatre).—Mr. Maurice Hewlett on "The Rise of the Renaissance in England." VI. 3.45 p.m.

Free Lectures to Artisans and others on Matters Connected with Building.—Professor H. Robinson on "Sanitary and Insanitary Dwellings," Carpenters' Hall, London Wall. 8 p.m.

Society of Arts.—Sir Roper Lethbridge, M.P., on "The Proposed Irish Channel Tunnel." 8 p.m.

Sanitary Institute.—Dr. Louis Parkes on "Model Dwellings in London, and Overcrowding on Space." 8 p.m.

THURSDAY, FEBRUARY 12.

Society for the Encouragement of the Fine Arts.—Mr. J. Todhunter on "An Unknown Painter." 8 p.m.

Institution of Electrical Engineers.—Discussion on Major-General C. E. Webber's paper on "The Distribution of Electricity, with especial reference to the Chelsea System." 8 p.m.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. Æneas J. G. Mackay, on "The Architecture of Scotch Towns, as Illustrating Scotch History." 8 p.m.

Dundee Institute of Architecture.—Mr. W. Norwell, on "Decoration in its Relation to Architecture." 7 p.m.

FRIDAY, FEBRUARY 13.

Institution of Civil Engineers (Students' Meeting).—Mr. W. Herbert Wheeler, on "The Cleaning and Deepening of Rivers and Canals by means of the Transporting-power of Water." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Lecture on "Sanitary Building Construction." 8 p.m.

SATURDAY, FEBRUARY 14.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "The Forces of Cohesion." I. 3 p.m.

London Geological Field Class (Gresham College).—Professor H. G. Seeley, F.R.S., on "The Gravel Beds of the Thames and its Tributaries in relation to Ancient and Modern Civilisation." II. 4.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

985.—WHITE PIGMENT: *H. Grimshaw.*—According to this invention metallic zinc is dissolved in a solution of zinc chloride, and the pigment precipitated. This pigment is afterwards ground in oil.

2,473.—CHIMNEYS OR FLUES: *J. Bennison.*—According to this invention a clay tube is built in the brickwork, extending to the roof or the apex of the chimney. The bottom, immediately above the fire, is cup or "trumpet shaped" at front or sides. Near the top an enlargement is formed, which is called an "anti-syphon chamber." In a chimney thus fitted down-draught is effectually prevented.

2,541.—SEWER VENTILATING SHAFTS: *F. Bird.*—To the underside of the manhole cover flaps are fitted. These are allowed to hang down vertically, but may be drawn up by a rod to the horizontal position, and fixed there by a button.

2,542.—VENTILATING COLUMNS: *F. Bird.*—This invention relates principally to means for enabling the connexion of the sewer ventilating pipe to be cut off when access is required to the column. The lower part of the column is in the form of a chamber, to which the sewer ventilating pipe is connected, the communication being under the control of a valve, by which the connexion is cut off where desired. At a convenient point perforated trays with charcoal are fitted to deodorise or disinfect the air.

2,787.—SAND-PAPERING WOOD: *E. Seddon.*—The principal improvement in sand-papering machines referred to in this invention is made by giving to the rollers a horizontal circular motion at the same time that they are revolving rapidly, so that the motion of any portion of the sand-paper surface is a continuously advancing circular motion, so that all scratches or marks made by the sand-paper are entirely removed. Mechanical means for effecting this motion are described in the specification.

18,476.—PLANES: *J. Habitzel* (Basel).—The plane which is the subject of this patent consists of a wooden stock, in the recess of which is fixed the metal bed of the plane iron; the iron is held in the bed by a spring plate, which replaces the cap, while by an adjustment of a screw nut on the screw spindle of the plane iron bed, the position of the latter, and consequently its penetration into the wood, can be regulated.

18,553.—DOOR SPRINGS: *G. Meyer* (Zurich).—This spring consists of a hollow drum rotating on a fixed arbour, secured at the upper part of a door-frame, around which winds a band attached at one end to the hollow drum, and at the other to the upper part of the door, unwinding when the door opens, and thereby winding a spring coil within the hollow drum, and made to rewind when the door is let go by reason of the spring coil recoiling.

NEW APPLICATIONS FOR PATENTS.

January 19.—929, N. Hart and W. Bone, Paint brushes.—933, C. Coe, Apparatus to prevent the bursting of Water-pipes.—937, E. and E. Atkins, Attaching Electrical Wires to Ceiling Roses.

January 20.—966, E. Arthur, Glazing or Enamelling Tiles, Bricks, &c.—972, J. Gascoyne, Window-fasteners.—977, W. Smail and J. Ewart, Roof-gutters, 1,029, C. Herzog, System of Water-piping as a Protection against Frost.

January 21.—1,064, H. Lewis, Joiners' Bench-cramp.—1,078, G. Charlton, Reversible Windows.—1,095, F. Jackson, Stoves, or Fireplaces.—1,113, A. Frampton, Wood-flooring, Parquetry, Ceilings, &c.—1,115, W. Taylor, Cement.

January 22.—1,147, G. Heaton, Cottage Dwellings.—1,155, A. Mitchell, Bolts and Latches for Casements, &c.

January 23.—1,213, R. Pope and W. May, Sash Cord Fastener.—1,238, E. Hoyland, Chimney Cowl.—1,242, R.

Ardagh, Wooden Paving Blocks.—1,247, J. Shanks, Lavatories or Wash-hand Basins.—1,259, P. Bracher, Chimney Tops or Ventilating Terminals.—1,280, A. Elmendorf and others, Water-closets.

January 24.—1,300, P. Rogers, Curing Smoky Chimneys.—1,310, J. Hart, Draught, Dust, and Rain Stoppers.—1,317, W. Dalling, Chimney Tops.—1,337, W. Manns, Building Construction.—1,345, H. Burnet, Preventing Water Pipes from Bursting.—1,358, E. Smith, Parquet Flooring.—1,360, W. Thompson, Stoves.—1,367, R. Coslett, jun., Flushing Cisterns for Water-closets, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,986, J. Clark, Pneumatic Flushing Apparatus for W.C.s, &c.—19,763, D. Baker, Closets and Fittings.—19,892, J. Burdon, Ventilating and other Gratings, &c.—19,991, P. Ayton, Casement Stays.—20,232, W. Kears and others, Storage Cistern and Water Waste-preventers.—20,730, J. McGlashan and E. Braidwood, Painters' Brushes, &c.—20,948, G. & C. Wernaer, Artificial Granite and Marble.—20,992, J. Jones, Electric Bell.—118, F. Pover, Ovens for Firing Bricks, &c.—231, J. Lloyd, Glaziers' Diamonds.—312, F. Holloway and E. Bastin, Tie Bricks.—355, H. Dent, Brickmaking Machinery.—417, W. Williams, Hanging Window-sashes.—509, W. Munns, Windows.—524, T. Hayton, Paving Slabs, &c.—535, G. Wise, Condensation Applied to Glazed Sashes, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

3,343, T. Fletcher, R. Brown, and W. Ure, Brick and Pottery Kilns.—4,348, T. Moss Flower, Spirit Level.—4,712, H. Doulton, Sewer.—12,423, H. Kilsey, Casement-fastener.—15,887, G. Redfern, Fire-grates.—16,852, J. Mason and Others, Treads for Floors, Stairs, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

JANUARY 27.—By *Ramsey & Co.:* 1 and 2 Rose Cottages, Peckham, u.t. 50 yrs., g.r. 8*l.*, r. 52*l.*, 250*l.*—By *S. B. Clark & Son:* 74, Mortimer-st., Regent-st., u.t. 15 yrs., g.r. 52*l.*, 540*l.*; 59, Clarence-gardens, Regent's-pk., u.t. 32 yrs., g.r. 21*l.*, r. 48*l.*, 180*l.*; 76 and 78, Augustus-st., u.t. 27 yrs., g.r. 28*l.*, 255*l.*—By *Debenham, Tewson, & Co.:* 2, Edbrooke-rd., Paddington, u.t. 72 yrs., g.r. 8*l.*, r. 44*l.*, 425*l.*; 43, Great Prescott-st., Aldgate, f., 400*l.*—By *Fuller & Fuller:* l.g.r. of 45*l.*, u.t. 928 yrs., Holland-pk-ter., Notting-hill, 1,915*l.*; f.g.r. of 37*l.* 10s., with reversion in 46 yrs., 1,540*l.*

JANUARY 28.—By *J. T. Bedford & Co.:* The lease and goodwill of 2, Vigo-st., Regent-st., u.t. 14 yrs., 750*l.*

JANUARY 29.—By *Herring, Son, & Daw:* No. 47, Lavender-hill, u.t. 80 yrs., g.r. 8*l.* 10s., 1,090*l.*—By *E. Stimson:* 1, Church-row, Chislehurst, u.t. 50 yrs., g.r. 7*l.* 10s., r. 90*l.*, 1,000*l.*; 53, Talfourd-rd., Peckham, f., 500*l.*; 12, Chivalry-rd., Clapham Junction, u.t. 77 yrs., g.r. 10*l.* 10s., 300*l.*—By *Wilkinson, Son, & Welch* (at Brighton): 49, Goldstone-villas, Brighton, f., r. 35*l.*, 500*l.*; 3, College-rd, f., r. 70*l.*, 1,290*l.*

JANUARY 30.—By *Rushworth & Stevens:* 38, Arbery-rd., Bethnal Green, u.t. 79 yrs., g.r., 5*l.* 10s., r. 37*l.* 14s., 270*l.*; 87 and 89, Talgarth-rd., West Kensington, u.t. 86 yrs., g.r. 24*l.*, r. 115*l.*, 1,010*l.*—By *R. Reid:* 1 and 2, Lumsden-st., Blackwall, f., r. 31*l.* 4s., 325*l.*; 14 and 16, Gaselee-st., f., r. 31*l.* 4s., 220*l.*; 22 and 24, Gaselee-st., f., r. 33*l.* 16s., 235*l.*; f.g.r. of 312*l.* 12s., with reversion in 55½ yrs., Richmond-rd., Bayswater, 8,895*l.*; f.g.r. of 40*l.*, with reversion in 55½ yrs., Talbot-rd., 1,075*l.*; f.g.r. of 10*l.* 15s., with reversion in 55½ yrs., 530*l.*; f.g.r. of 118*l.* 12s., with reversion in 55½ yrs., Victoria-pl., 3,065*l.*; f.g.r. of 232*l.* 10s., with reversion in 55½ yrs., Artesian-rd., 6,375*l.*; f.g.r. of 49*l.*, with reversion in 55½ yrs., Norfolk-rd., 1,350*l.*; f.g.r. of 5*l.*, with reversion in 55½ yrs., 350*l.*; f.g.r. of 243*l.* 9s., with reversion in 55½ yrs., Ledbury-rd., 6,665*l.*; No. 97A, Talbot-rd., f., r. 85*l.*, 1,660*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	6/15/0	7/5/0
Teak, E.I... load	10/0/0	13/0/0
Sequoia, U.S. ft. cu.	2/3	3/0
Ash, Canada load	2/10/0	4/5/0
Birch, do.	2/5/0	4/5/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	2/0/0	3/15/0
Oak, do.	2/10/0	4/10/0
Canada.....	4/17/6	6/10/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/0/0	5/10/0
Lath, D'ntsic, fath	5/0/0	6/0/0
St. Petersburg	5/0/0	7/0/0
Deals, Finland, 2nd & 1st std 100	7/10/0	10/0/0
Do, 4th & 3rd ..	7/0/0	7/5/0
Do. Riga	6/0/0	8/0/0
St. Petersburg, 1st yellow ..	9/10/0	14/10/0
Do, 2nd yellow	7/10/0	9/0/0
Do, white	7/0/0	10/0/0
Swedish	7/0/0	15/10/0
White Sea	8/0/0	17/0/0
Canada, Pine 1st	13/0/0	24/0/0
Do. do. 2nd....	9/0/0	16/0/0
Do. do. 3rd, &c.	7/0/0	10/0/0
Do. Spruce. 1st	8/10/0	10/10/0
Do. do. 3rd & 2nd.....	6/10/0	8/0/0
New Brunswick	5/10/0	7/10/0
Battens, all kinds	4/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0/10/0	0/14/0
Do. 2nd.....	0/8/0	0/10/6
Other qualities	0/5/6	0/7/9
Cedar, Cuba ..ft.	/4	/5
Honduras, &c.	/4¼	/4½
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4½	/6½
Mexican do. do	/4½	/5½
Tobasco do. do	/5½	/6½
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	13/0/0
Rose, Rio.....	12/0/0	19/0/0
Bahia	10/0/0	18/0/0

TIMBER (*continued*).		
Satin, St. Domingo .....ft.	0/0/9	0/1/3
Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/4	0/0/7
METALS.		
IRON—Bar, Welsh, in London..ton	6/5/0	6/15/0
Do. at works in Wales	5/15/0	6/5/0
Do. Staffordshire, in London	6/5/0	7/0/0
COPPER—British, cake and ingot	56/0/0	57/0/0
Best selected ..	59/0/0	60/0/0
Sheets, strong..	66/0/0	0/0/0
Chili, bars	52/10/0	0/0/0
YELLOW METAL lb.	0/0/6	0/0/6½
LEAD—Pig, Spanish....ton	12/0/0	12/12/6
English, com. brands	12/12/6	12/15/0
Sheet, English, 3 lbs. per sq. ft. and upwards ..	15/0/0	15/5/0
Pipe	15/10/0	0/0/0
ZINC—English sheet .....ton	25/5/0	26/10/0
Vieille Montagne.....	27/0/0	0/0/0
TIN—Straits	90/10/0	0/0/0
Australian	90/15/0	0/0/0
English ingots	94/10/0	0/0/0
OILS.		
Linseed .....ton	22/0/0	22/5/0
Cocoanut, Cochin	33/15/0	34/0/0
Do. Ceylon	28/15/0	29/0/0
Palm, Lagos	25/10/0	26/0/0
Rapeseed, English pale	29/5/0	0/0/0
Do. brown	27/5/0	27/10/0
Cottonseed ref...	18/7/6	0/0/0
Oleine	22/0/0	24/0/0
Lubricating, U.S.	6/0/0	7/0/0
Do. refined	7/10/0	12/0/0
TAR—Stockholm barrel	1/1/6	1/2/0
Archangel	0/14/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ASHBY-DE-LA-ZOUCH.—For the construction of pipe sewers with manholes, &c., Coalville, for the Rural Sanitary Authority. Mr. John W. Metcalf, Surveyor, 31, Tamworth-road, Ashby-de-la-Zouch :—

Geo. F. Todd, Derby (accepted) £173 0 0

BANGOR.—For enlarging and altering "Menai Bridge Vaults," for Messrs. Worthington & Co., Limited, Burton-on-Trent. Mr. Richard Davies, architect, Bangor, North Wales :—

R. & J. Williams	£998	E. Williams, Garth, Bangor*	£972

* Accepted.

BIRMINGHAM.—For building house and stabling, Barnt Green, for Mr. S. Caswell. Messrs. J. P. Sharp & Co., architects :—

F. Briley	£1,940	Huins & Sons	£1,875
E. Giles	1,900	J. Webb	1,777
G. Gill	1,897	Walton Bros.	1,775
J. Gethin	1,892	G. H. Marshall.....	1,759
B. Whitehouse.....	1,885		

BIRMINGHAM.—For house, lodge, and stabling, Barnt Green, for Mr. T. Hughes. Messrs. J. P. Sharp & Co., architects :—

G. Gill.....	£2,600	Lidzey & Evans	£2,373
J. Webb	2,485	F. Briley	2,350
Walton Bros.....	2,484	B. Whitehouse.....	2,349
T. Johnson.....	2,435	E. Giles	2,320
F. Davis.....	2,436	G. H. Marshall (accepted)	2,297

BIRMINGHAM.—For the erection of a house, Westfield-road, Edgbaston, for the Rev. Robt. Aldridge. Messrs. J. P. Sharp & Co., architects :—

Gowing & Ingram (accepted)..... £1,459 0 0

BIRMINGHAM.—For additions to printing works, Paternoster-row, for Messrs. Cond Bros. Messrs. J. P. Sharp & Co., architects :—

G. Gill (accepted)..... £507 0 0

BRENTWOOD.—For providing and laying a 9-in. glazed pipe-drain to Shenfield, for the Billericay Union Rural Sanitary Authority :—

	s.	d.	
George Burtwell	9	6	Per Yard.
Rogers & Robson	7	6	,,
R. Claydon.....	6	0	,,

[All of Brentwood.]

CARDIFF.—For re-building the "Queen's Hotel," Cardiff, for Mr. W. J. Jeenes. Quantities by the architect :—

D. Davies.....	£16,460 0 0	R. Price	£15,300 0 0
F. S. Lock	16,069 0 0	Burton & Co.	14,950 0 0
J. Hopkins	15,861 2 5	D. J. Davies	14,920 0 0
J. Haines	15.648 0 0	Shepherd & Son ..	14,340 0 0
Jones Bros.	15,600 0 0	J. Allan (accepted)	14,329 0 0

[All of Cardiff.]

CORNWALL.—For re-building the Trekerner Bridge, over the river Lynher, for the Cornwall County Council. Mr. S. W. Jenkin, County Surveyor, Liskeard :—

J. D. Hobbs	£275	Hicks & Hoar, Rilla Mill, Linkinhorne, Cornwall* ..	£248

* Accepted.

FALMOUTH.—For building hedges and for masons' and smiths work at the Burial Ground, for the Burial Board of the Town and Parish of Falmouth. Mr. W. H. Tresidder, Borough Surveyor, Falmouth :—

James Hodge	£179 14 0	Saml. Bray, Falmouth*	£115 0 0
W. Anstey	118 0 0		

* Accepted.

Granite Work for Entrance.

C. Barnicoat, Falmouth (accepted) £37 10 0

Iron Gates.

W. Jane, Falmouth (accepted) £17 18 6

HAMMERSMITH.—For road and paving works, Willow-vale, for the Hammersmith Vestry. Mr. H. Mair, Surveyor, Vestry-hall, Broadway, Hammersmith :—

Killingback & Co.	£775	Tomes & Wimpey, Hammersmith*	£675
Nowell & Robson	689		
Rogers & Co.....	680		

* Accepted.

HANLEY.—For alterations to the "Wheat-Sheaf" Inn, Broom-street, for Messrs. W. Showell & Son. Mr. E. Penn, architect, Stoke :—

Geo. Harris, Stoke (accepted) £240

KENT.—For ground-work, &c., at the Gore Farm Hospital, Kent, for the Metropolitan Asylum Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. :—

F. White	£342 16 0
G. Osenton, Westerham, Kent (accepted)	310 0 0

LEAMINGTON.—For wrought-iron arched bridge over the Leam. Mr. W. de Normanville, Engineer, Town-hall, Leamington :—

Gimson	£2,067 15 0	W. Jenkins	£1,672 0 0
J. Dixon.....	1,893 19 7	A. Thorne, 143, Cannon-street, London (accepted).	1,528 0 0
J. Glover & Son	1,886 16 6		
Jesse Tildesley.....	1,695 0 0		

LEEDS.—Accepted for the erection of a Wesleyan Sunday school, infants' school, classs-rooms, &c., Dewsbury-road. Mr. George F. Danby, architect, 46, Great George-street, Leeds :—

Paul Rhodes, *Bricklayer and Mason*, Leeds	£1,020 0 0
Thos. Harrod, *Carpenter and Joiner*, Leeds	630 0 0
J. Lindley, *Plumber and Glazier*, Leeds	192 0 0
W. Atkinson, *Slater*.....	80 0 0
W. Pennington, *Plasterer*	85 0 0
A. Bateman, *Painter*	36 0 0
Total.....	£2,043 0 0

LONDON.—For the erection of a school to provide acommodation for 800 children on the Ilderton-road Site, Rotherhithe New-road, for the School Board for London. Mr. T. J Bailey, Architect :—

		If brickwork be built in cement.
J. T. Chappell	£18,917	£19,367
D. Charteris	18,896	19,334
J. Mowlem & Co.....	18,416	18,740
S. & W. Pattinson	17,416	17,690
Peto Bros.	16,752	17,126
W. H. Lorden & Sons.....	16,502	16,869
W. Downs	16,387	16,567
Atherton & Latta.....	16,176	16,566
C. Cox	15,856	16,278
E. Lawrance & Son	15,852	16,250
J. Bull, Sons, & Co., Limited	15,697*	16,070
J. W. Hobbs & Co., Limited	13,750	14,076

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of two new iron buildings on the site in Bailey's-lane, Stamford-hill, for the School Board for London. Mr. T. J. Bailey, Architect :—

J. Dixon & Co.....	£1,408	W. Jones	£1,090
T. Cruwys	1,200	Croggon & Co., Ltd.....	1,085*

* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of two new iron buildings on the site in Glyn-road, Homerton. for the School Board for London. Mr. T. J. Bailey, Architect :—

J. Dixon & Co.....	£1,456	Croggon & Co., Limited....	£1,075
W. Jones	1,110	T. Cruwys*.....	1,060

* Recommended by the Works Committee for acceptance.

LONDON.—For rebuilding the "Three Stags" tavern, Lambeth-road, for Mr. John German. Mr. Alfred Wright, architect and surveyor, 61, Kennington-road, S.E. :—

John J. Ford.....	£4,798 0 0	Burman & Sons	£3,939 0 0
Gould & Brand.....	4,079 0 0	E. Toms.....	3,863 0 0
Canning & Mullens..	4,050 0 0	W. Johnson	3,810 0 0
J. Mills	4,030 0 0	J. Tyerman	3,750 0 0
W. Smith	4,030 0 0	T. Voller	3,746 0 0
Allen & Sons.....	3,967 0 0	J. Beale	3,600 0 0

LONDON.—For the erection of a pair of semi-detached houses in Hardy-road, Westcombe-park Estate, Blackheath. Mr. A. Broad, Architect, 27, Dingwall-road, Croydon :—

Kirk & Randall	£1,950	S. J. Jerrard	£1,700
J. Smith & Son	1,835	Baalam Bros.	1,700
G. Carter	1,800	Soper (accepted)	1,570
E. P. Bulled.....	1,797		

LONDON.—For alterations to the "Cambridge Hotel," Westow hill, Norwood, for Mr. Minto. Mr. H. T. Bonner, architect, 29 and 30, King-street, E.C. :—

Bowyer	£2 130	Robson	£1,900
Walker	2,025	Hayward	1,884
Poole	1,980	Smith	1,875
Toms	1,927	Holloway	1,855
Spencer	1,924		

LONDON.—For the erection of new warehouse, Dean-street, Fetter-lane, for Messrs. Leighton, Son, & Hodge. Mr. H. J. Treadwell, architect, 2, Waterloo-place, Pall Mall :—

T. Ashby.....	£2,954	T. Peto	£2,785
Rider	2,868	Macey	2,784
Colls & Son.....	2,824	C. F. Kearley (accepted) ..	2,738

LONDON.—For pulling down and rebuilding the "Foresters' Arms tavern, Kensal New Town, W., for Mr. E. Tabernacle. Messrs. Wylson & Long, architects, 15, King William-street, Strand, W.C. :—

Eddie	£4,298	T. L. Green	£3,972
Patman & Fotheringham..	4,075	J. T. Chappell	3,842
Adamson & Sons	3,976	C. F. Kearley (accepted) ..	3,760

LONDON.—For the erection of mortuary buildings at the rear of police-station, Mare-street, Hackney, for the Hackney Board of Works. Mr. Jas. Lovegrove, Chief Surveyor, New Town Hall, Mare-street, Hackney. Quantities by Mr. Peterson, 12 and 13, Poultry, E.C. :—

G. Moore	£2,234 5 6	J. W. Mollett	1,861 0 0
C. Wilson	2,224 0 0	A. Martin	1,798 12 0
Allen & Son	2,196 0 0	Brass & Sons.....	1,798 0 0
Thomas Boyce	2,196 0 0	Shurmur, Upper Clapton (accepted)	1,764 0 0
Wm. Neill.....	2,175 0 0		
Charles Cox	1,970 0 0	Sabey & Son	1,728 0 0
Thomerson & Son ..	1,927 10 0	William Higgs.....	1,610 15 0

LONDON.—For alterations and additions to stables, for the Junior Army and Navy Stores (Limited). Mr. F. Dudley, architect :—

P. & H. Lawrie (accepted) £1,330 0 0

LONDON.—For the restoration of St. Benet's Church, Queen Victoria-street, after damage by the late fire, for the Earl of Powis and others. Mr. Herbert Knight, architect, 129, Cheapside :—

F. Prater, Walthamstow (accepted) £627

LONDON.—For the erection of shops with flats above at Clapham-road (corner of South Island-place), for Mr. G. Pearson. Mr. A. W. Tribe, 316, Kennington-park-road, S.E., architect :—

W. & C. H. Young, Courland-grove, Clapham (accepted).. £925 0 0

LONDON.—For the erection of workmen's dwellings in Brighton-street, and Argyle-place, Cromer-street, Gray's Inn-road, W.C., for the East-End Dwellings Company, Limited. Messrs. Davis & Emanuel, architects, 2, Finsbury-circus, E.C. :—

Holiday & Greenwood....	£11,333	Colls & sons.....	£10,499
Williams & Sons	11,128	F. & F. Wood	10,420
Mowlem & Co.....	10,736	Woodward & Co.....	10,379
Rider & Sons	10,696	Harris & Wardrop	10,279
Ashby Bros.	10,610	Lawrence & Sons	10,269
Dove Bros.	10,570	S. I. Jenard (accepted) ..	10,269

LONDON.—For sanitary work at Mary-place Workhouse, &c., for the Guardians of St. Mary Abbotts, Kensington. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. :—

J. Mears	£475 0 0	W. B. Head & Son	289 0 0
A. W. Derby	385 0 0	W. Johnson	265 0 0
H. Haynes	343 0 0	Leslie & Co. (accepted)	263 10 0

[Architect's estimate, £280.]

LONDON.—For the erection of a mortuary, coroner's-court, offices, and rooms attached thereto, in George-yard, Whitechapel, for the Whitechapel District Board of Works. Mr. Wm. La Riviere, architect, 15, Great Alie-street, E. Quantities by Mr. Herbert O. Ellis, 46, Fenchurch-street, E.C. :—

G. Lunn & Son	£2,355 14 0	J. Cattley	£2,050 0 0
W. Catmur	2,290 0 0	A. Eaton.....	2,049 0 0
J. R. Hunt	2,149 0 0	Outhwaite & Son....	2,044 0 0
Jno. Greenwood	2,134 0 0	Coulsell Bros.	1,992 0 0
F. & F. J. Wood	2,096 0 0	Thos. Little	1,893 0 0
Perry & Co.	2,094 0 0	W. Gladding.....	1,888 0 0
J. Morter	2,064 0 0	Mark Gentry	1,885 0 0
Ashby & Horner	2,058 0 0		

LONDON.—For the erection of house, Kensal Green, for Mr. G. Fuller. Mr. Thos. S. Stephens, architect :—

F. T. Chinchen, Kensal Green (accepted) £850 0 0

LONDON.—For sanitary alterations at 27, Hyde Park-gardens, W. Mr. George A. Hall, architect, 7, Victoria-street, S.W. :—

The North British Plumbing Co.	£223 0 0
The Sanitation Co., Limited, 14, Victoria-street, S.W. (accepted)	212 0 0

MIDDLESBROUGH.—For the erection of the Victoria-road schools (exclusive of heating or furniture) for the School Board. Mr. J. Mitchell Bottomley, architect, 18, Albert-road, Middlesbrough :—

J. Howe	£11,180 0 0	Wm. Sturdy	£10,150 0 0
J. Johnson & Son..	10,545 7 0	Craggs & Benson ..	9,966 0 0
John Hall, Thorp, & Son	10,469 0 0	Allison Bros	9,950 0 0
Robt. Kitching	10,438 0 0	R. Braithwaite	9,895 0 0
John Johnson	10,279 10 0	Wm. Bastiman....	9,882 16 4
Jonas France	10,211 0 0	W. & R. Blackett..	9,750 0 0
Hudson Bros.....	10,154 0 0	Thos. Dickinson, Middlesbro'*	9,650 0 0

* Accepted.

NEW TREDEGAR.—For the erection of 34 cottages, for the New Tredegar Building Company, Limited. Mr. John Morgan, architect and surveyor, Blaenavon :—

Osborne & Co., East Grinstead £4,012

NORTHAMPTON.—For the erection of new offices, Cattle Market, for the Corporation. Mr. W. J. Brown, Borough Surveyor, 11, St. Giles'-street, Northampton. Quantities by the Borough Surveyor :—

J. Robinson	£265 0	G. J. Fisher	£235 0
R. Cosford	264 10	J. Warren	227 0
J. B. Clarke	252 0	R. Hickman	223 0
Green Bros.....	245 0	Woodford & Son	220 0
G. White.....	245 0	A. P. Hawtin, Northampton (accepted)	219 0
Clayson Bros.....	244 0		

RAMSGATE.—For alterations and additions, No. 17, Harbour-street, for Mr. Geo. Bates. Messrs. Langham & Cole, architects, Ramsgate and Broadstairs :—

	Main Building.	Fittings.
W. W. Martin	£1,200 0 0	£223 0 0*
Newby Bros.	1,107 0 0	227 0 0
Chas. Home	1,100 0 0†	300 0 0
C. J. Luff	—	255 14 0

* Accepted subject to modification. † Accepted.

SOUTH BRENT (Devon).—For additions to Lutton House. Mr. R. C. Reade, M.A., architect, Torquay :—

W. A. Goss	£218 0 0	Yabsley & Hodge	£153 0 4
R. Veale	165 0 0	R. Codd, South Brent*	135 10 0

* Accepted.

SOUTH SHOEBURY.—For additions to Board Schools, South Shoebury, Essex. Mr. Walter J. Wood, architect, 1, Finsbury-circus, E.C. Quantities by Mr. Henry Bushell :—

Baker & Wiseman	£770 0 0	Woodhams	£671 0 0
Darke & Son	695 0 0	Alp & Vintris, Shoebury (accepted)	668 16 7
Dupont	694 0 0		

SOWERBY BRIDGE.—For the supply of fireclay retorts, firebricks, clay, &c., at gas-works, for the Local Board. Mr. John Marsland, Engineer, Gas-works, Sowerby Bridge, Yorks :—

Josh Morton, Halifax, 3s. 6d. per ft. retorts (accepted).
The Ellenroyde Brick and Tile Company, Halifax, £2. 17s. 6d. per 1,000 bricks (accepted).
John Morton, Halifax, £2. 17s. 6d. per 1,000 bricks.
Geo. & W. Halliwell, Halifax, £2. 17s. 6d. per 1,000 bricks.
Glenboig Clay Co., Glasgow, £4. 15s. 0d. bricks. 4s. 9d. per ft. retorts
Peter Hartt, Glasgow £4. 0s. 0d. bricks. 5s. 0d. per ft. retorts.

STOKE-UPON-TRENT.—For alterations to the "Holly Bush" Inn, Fenton, for Messrs. W. Showell & Sons. Mr. E. Penn, architect, Stoke :—

Chatfield	£263	Harris, Stoke (accepted)	£215
Yoxall	220		

STOKE-UPON-TRENT.—For house in James-street, for Mr. Geo. Bartle. Mr. E. Penn, architect :—
J. R. Yoxall, Stoke (accepted) £335

STOKE-UPON-TRENT.—For alterations to the "Cock" Inn, John-street, for Messrs. Charrington & Co. Mr. E. Penn, architect :—
G. H. Hancock (accepted) £134 0 0
Painting and Papering.
Cartlidge (accepted) £47 0 0

STOKE-UPON-TRENT.—For alterations to the "Jolly Potters" Inn, Hartshill, for Mr. Chatfield. Mr. E. Penn, architect :—

Gallimore	£220	Harris	£180
Bradbury	200	Yoxall (accepted)	150

STOKE-UPON-TRENT.—For erecting two cottages in West-street, Penkhull, for Mr. Alderman Leason. Mr. E. Penn, architect :—

Bradbury	£517	Harris	£460
Hancock	490	Yoxall (accepted)	455

STRATFORD, E.—For additions to the Theatre Royal. Mr. J. G. Buckle, architect, 19, York-buildings, Adelphi :—
D. G. Laing & Son (accepted) £1,574 0 0

TEWKESBURY.—For alterations and additions to the Town-hall, for the Corporation Messrs Medland & Son, architects, Gloucester. Quantities by Mr. F. E. Godwin, Gloucester :—

Reed, Blight, & Co.	£2,099 0 0	Freeman & Jones	£1,423 0 0
H. Willcock	1,650 0 0	W. Bowers & Co.	1,302 0 0
J. Greenslade	1,550 0 0	Malvern & Sons	1,283 0 0
W. C. Channon	1,497 0 0	E. Young	1,089 7 6
Wm. Jones	1,480 0 0	J. W. Howell. Tewkesbury (accepted)	979 15 0
Henry Smith	1,442 0 0		

TONBRIDGE.—For detached residence, Hilden Manor Estate, Tonbridge. Mr. W. B. Hughes, architect :—

Hudson	£1,267 10 0	Mason & Elwig	£1,185 0 0
Langridge	1,196 0 0	Jarvis	1,165 0 0
Avard	1,189 0 0	Jones	1,118 4 5

Weights and Measures Offices, Newington.—In the list of tenders for this job, published last week (p. 97) for "F. T. Churcher" read "F. T. *Chinchen*"

TO CORRESPONDENTS.

N. S. (we wrote from personal knowledge of the place).—W. H. (the top stone of the southern spire of Cologne was laid on the occasion of the "completion" fête in 1880 but a good deal of work has been done since then, in the way of sculpture, and repairs to the roofs and floor. The second pair of new doors has only just been fixed).—J. H. (a hoisting scaffold of that kind for interior work is nothing new).—K. D. K. & Co. (paper referred to not to hand up to going to press. Shall have attention when received).—G. L. S.—A. C. (shall have attention).—F. T. (next week).—S. W. (list cannot be inserted, as our conditions are not complied with. Amounts should be stated). B. C. & Co. (amount should be sent).—S. & Sons (too small).—C. W. (should send amount).—O. & Co. (too late for this week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent

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AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

Now ready.
READING CASES, NINEPENCE EACH. By post (carefully packed), 1s.

HOWARD & SONS

25, 26, 27, BERNERS STREET, W.,

MANUFACTURERS AND CONTRACTORS

Deal Dadoes, from 1s. 2d. per ft. super.
Oak Dadoes ,, 1s. 8d. ,,
Walnut Dadoes ,, 1s. 11d. ,,
Oak, 1 inch Parquet Floors, laid and polished, from £7. 10s. a square.
Solid 1-inch Oak, straight boards, laid and polished, at £6. 18s. a square.
Solid ¾-inch Oak Parquet for covering Deal floors, laid and polished, from £5 a square.
Oak Wood Tapestry Dadoes, from 1s. per foot super.
Walnut or Mahogany, from 1s. 3d. per foot. super.
Ditto with Heavy Mouldings, 4d. ft. extra.
Ditto, ditto, with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves Over-doors, Chimney-pieces, Stoves, and Hearths. Architects' and Surveyors' attention particularly called to the above Quotations for

BILLS OF QUANTITIES.

HOWARD & SONS

Tender for Contracts for any Joiners' work, or Ornamental Plaster. Painting, Plain or Decorative. Wrought-Iron Work. Stained Cathedral Glass, and any other Interio Work.

The Builder Cathedral Series.

THE demand for No. 1 (Canterbury) has been so unprecedentedly large that, within a month of publication, the stock is reduced to a minimum.

To prevent disappointment to those who may be desirous of possessing the whole of the series, it is intended to devote, as far as possible, the few hundred copies remaining of the NEW YEAR'S NUMBER (January 3rd, 1891) to the completion of sets, and the charge for same is, therefore, raised to

ONE SHILLING EACH.

Office—46, Catherine-street, Covent-garden, W.C.

BEST BATH STONE.

CORSHAM DOWN. BOX GROUND. WESTWOOD GROUND. FARLEIGH DOWN. COMBE DOWN. STOKE GROUND.

THE BATH STONE FIRMS, Limited.
HEAD OFFICES: BATH.

DOULTING FREESTONE.

THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.

Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

CRAIGLEITH STONE.

UNEQUALLED for Staircases, Steps, and Landings, especially for Public Buildings with great wear. VERY HARD, and NEVER WEARS SLIPPERY.

SOLE AGENTS for England,

J. & A. CREW, Cumberland Market, London, N.W.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO.'S

INK-PHOTO PROCESS,
22, Martin's-lane,
Cannon-street, E.C. [ADVT.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.
METCHIM & SON, 20, Parliament-st., S.W.
"QUANTITY SURVEYORS' TABLES AND DIARY." Revised and Enlarged for 1891 now ready, 6d. [ADVT.

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& CO. LIMITED,

PATENT PROTECTOR AND LEVER LOCKS,

For all Purposes.

STEEL SAFES, STRONG-ROOM AND PARTY-WALL DOORS.

Patent Clutch-Rebated Self-Closing or Folding Doors, for Theatres and Public Buildings,

As approved by the Metropolitan Board of Works (used in large numbers at Covent Garden Theatre).

Offices & Warehouse: 76, CHEAPSIDE, *London; Manufactories, Wharncliffe Works, Arlington-st., London, N.*

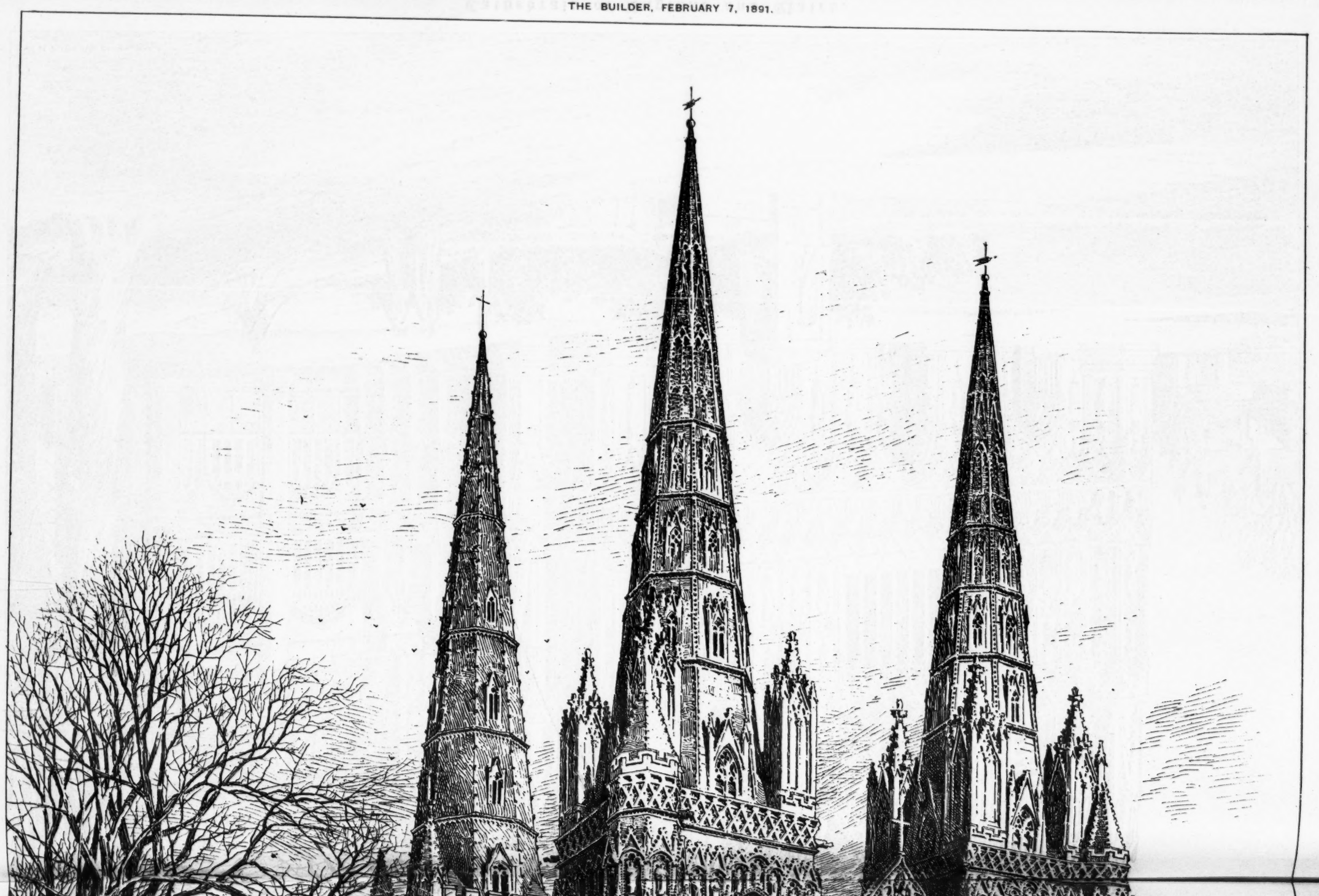


PHOTO-LITHO. SPRAGUE & Co. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

Cathedrals of England and Wales.

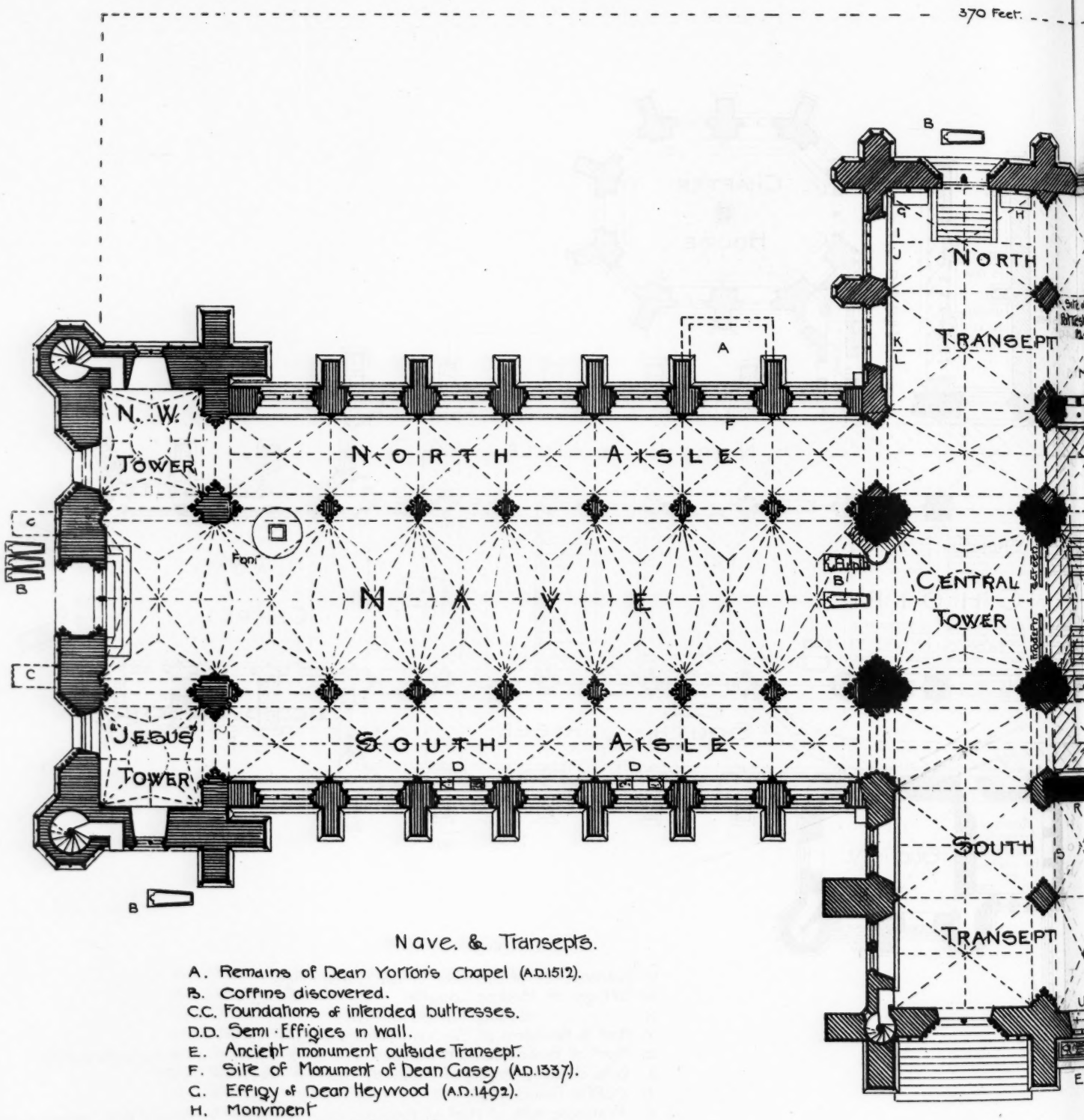
No. 2. LICHFIELD.—Drawn by Mr. W. H. Bidlake.

LICHFIELD CATHEDRAL.

GROUND PLAN.

10 5 0 10 20 30 40 50 60 70 80 90 100 FEET.

Scale.



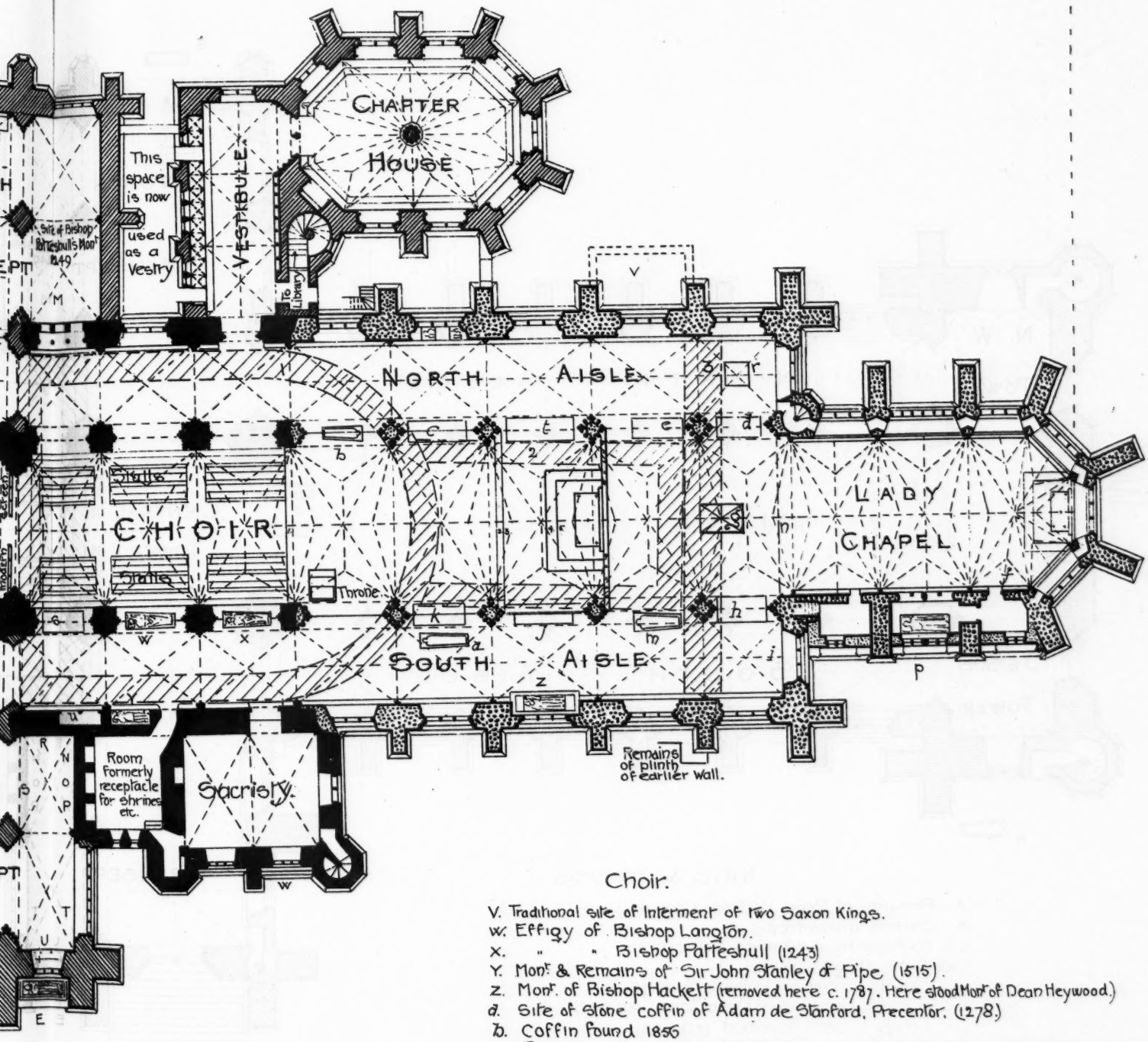
Nave. & Transepts.

A. Remains of Dean Yorton's Chapel (A.D.1512).
B. Coffins discovered.
C.C. Foundations of intended buttresses.
D.D. Semi-Effigies in Wall.
E. Ancient monument outside Transept.
F. Site of Monument of Dean Gasey (A.D.1337).
G. Effigy of Dean Heywood (A.D.1492).
H. Monument
I. Mon^t Mrs. Mary Madan. (1827).
J. " Gen^l Rich^d Vyse (1825)
K. " Sir Chas. Oakley. Bart. (1826)
L. " Catherine Buckeridge (1787. Westmacott, sculptor).
M. Organ (now occupies whole of Aisle).
N. Bust of D^r Johnston (1784 Westmacott sculptor).
O. Mon^t Bishop Cornwallis (1824).
P. Bust of Garrick (1799: Westmacott sculptor).
R. Mon^t Andrew Newton Esq (1806).
S. Officers 80^th Reg^t Staffordshire Volunteers (1791).
T. Mon^t Bishop Smallbroke (1749).
U. Dean Howard (1868).
Here first stood that of Bishop Langton & secondly that of Bishop Hackett 1670. whose remains still rest below.

Approximate Dates.

Choir 1200
S. Transept 1220
N. Transept 1240
Chapter Ho.

Note The portions hatched in Choir & shew (1) The foundations of the A & (3) The transverse wall which form



Choir.

V. Traditional site of Interment of two Saxon Kings.
w. Effigy of Bishop Langton.
x. " " Bishop Hatfieshull (1243)
Y. Mon^{t} & Remains of Sir John Stanley of Pipe (1515).
z. Mon^{t}. of Bishop Hackett (removed here c. 1787. Here stood Mon^{t} of Dean Heywood.)
d. Site of stone coffin of Adam de Stanford, Precentor. (1278.)
b. Coffin found 1856
c. Probable site of Mon^{t}. of Bishop Scrope. (afterwards Archbishop of York). Beheaded 1405.
d. Site of Mon^{t} of Bishop Stretton (1385).
e. Probable site of Mon^{t} of Bishop Blythe 1530
f. Site of Mon^{t} of Rob^{t} Master, Chancellor (1625) Destroyed during Civil Wars.
g. Site of Shrine of St. Chad.
h. Site of Robert Lord Bassett's Mon^{t} (1390). Described by Sir. W. Scott as Marmion's
i. "Sleeping Children" Daus. of Canon Robinson (1812 & 1813) Sir F. Chantrey 1817.
j. Site of Bishop Langton's Mon^{t} (1322)
k. Probable Site of Mon^{t} of Bishop Longespee or Meulan or Meylan (1296).
m. Bishop Wm de Cornhull (d. 1223).
n. Site of Stone Screen. Destroyed during Civil Wars.
p. Three 14th Century Mon^{ts}, restored 1879, in memory of Bishop Selwyn.
r. Bishop Ryder d 1836 (Sir F. Chantrey sculptor).
s. Major Hodson 1858 (G.E. Street R.A.).
t. Bishop Lonsdale 1868 (Sir G.G. Scott RA. Effigy by Watts)
u. Archdeacon Hodson 1855 (G.E. Street RA. Earp Sculptor)
w. Ancient Mon^{t} outside Sacristy (15th Century).

Roland W. Paul Hon. Sec. of Arch.
Jany. 1891.

PHOTO-LITHO. SPRAGUE & Co. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

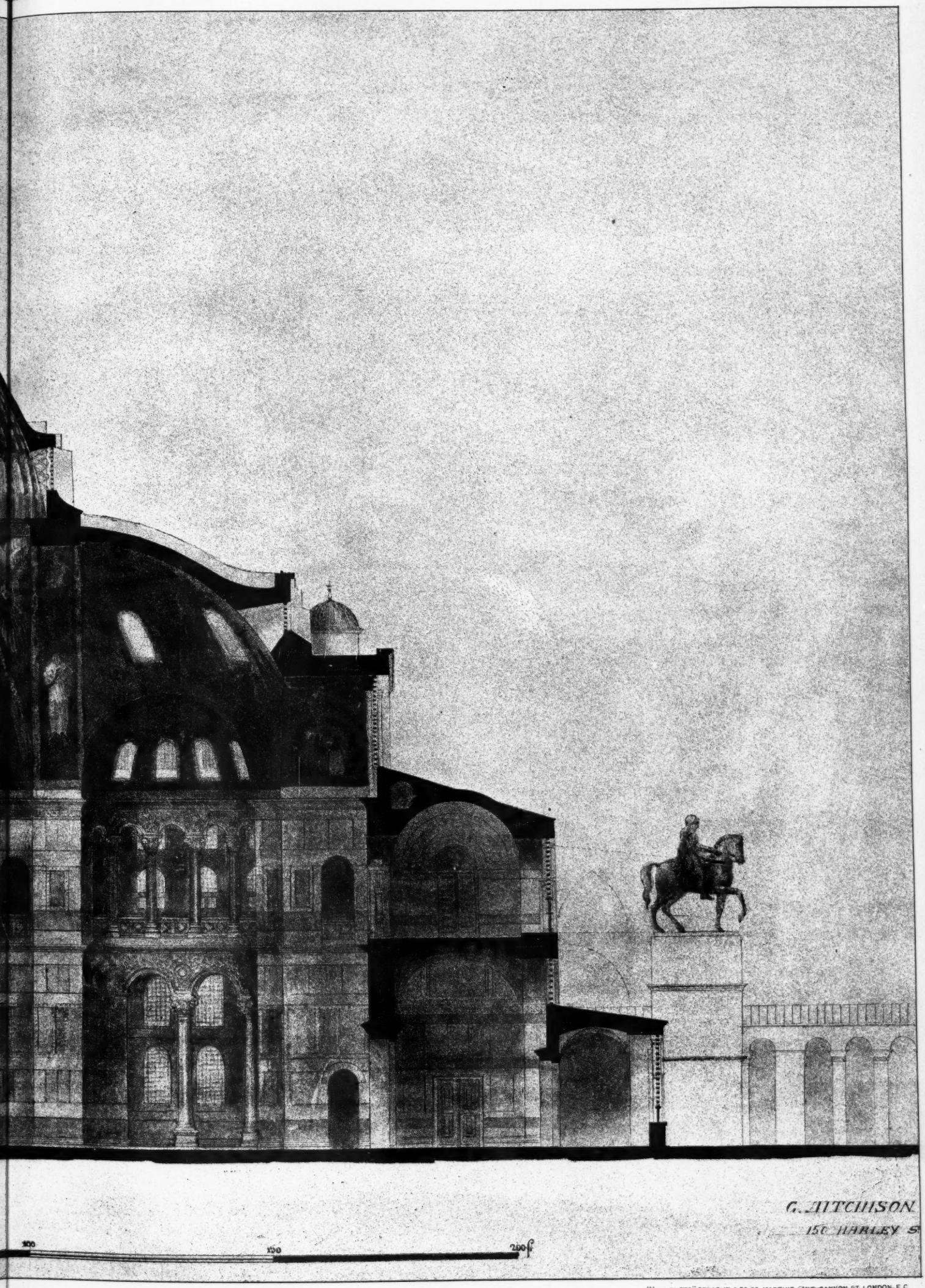
STA SOPHIA

SECTION E to W.

BYZANTINE ARCHITE

ILLUSTRATIONS TO PROFESSOR AITCHISON'S ROYAL

SECTION OF STA. SOPHIA CONSTA



G. AITCHISON
150 HARLEY ST

100 150 200 ft

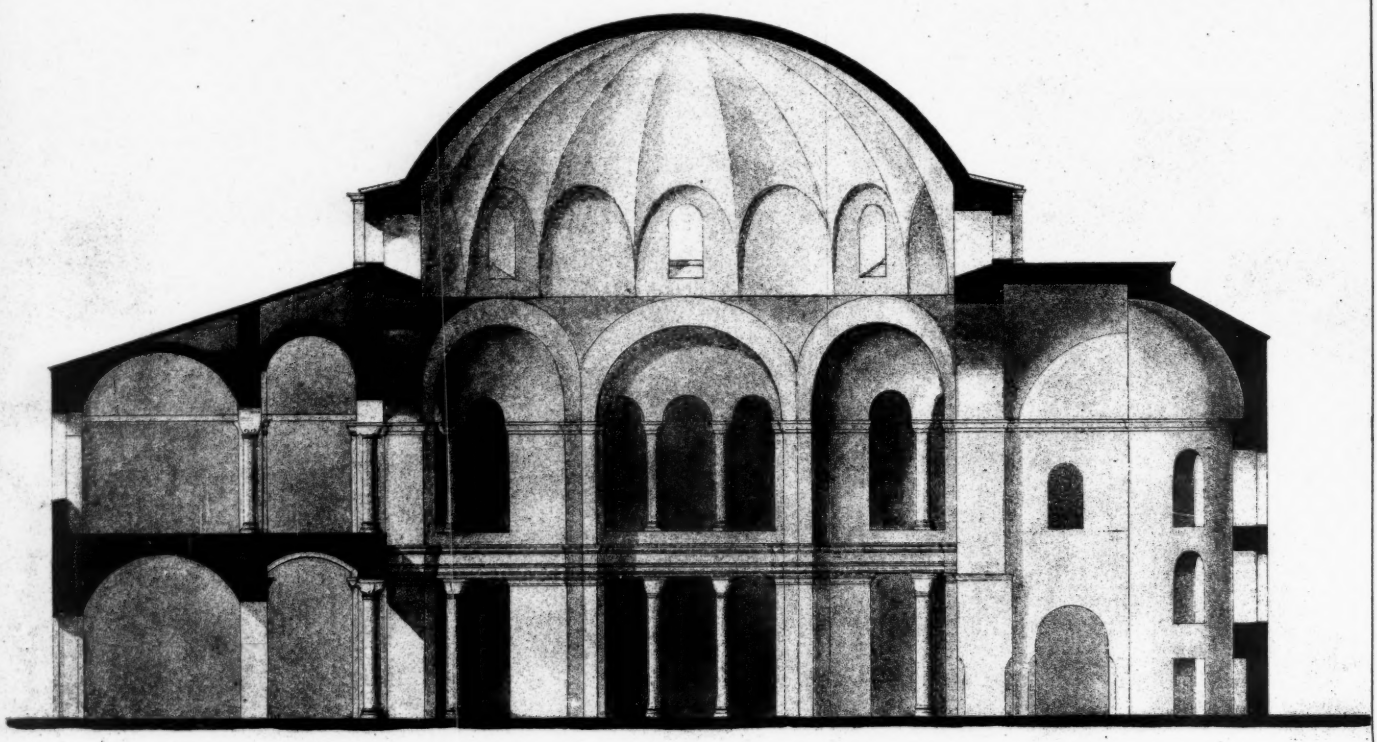
"INK-PHOTO" SPRAGUE & Co. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

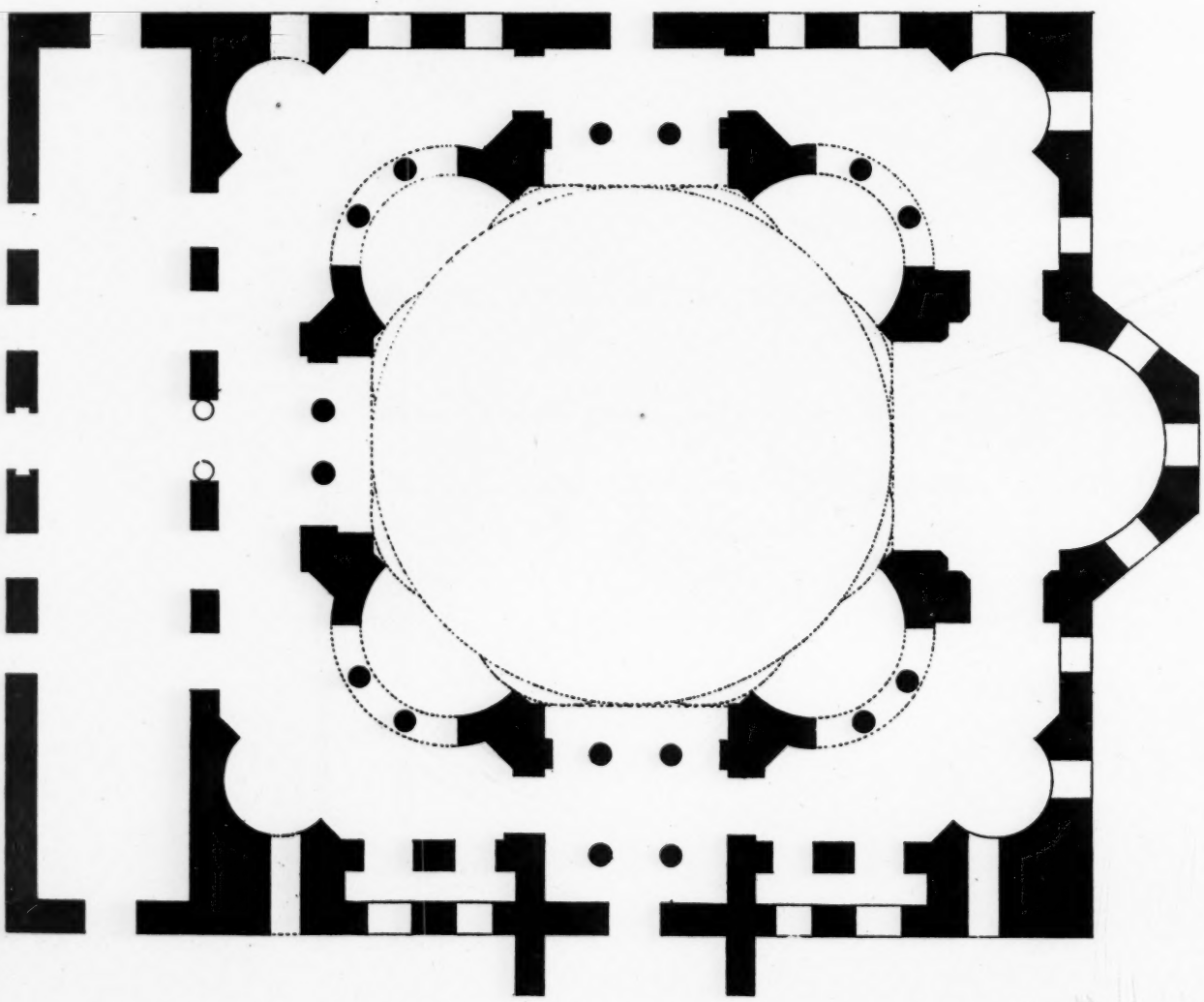
CHITECTURE:

ROYAL ACADEMY LECTURES. LECTURE II.

A, CONSTANTINOPLE.

ST. SERGIVS.





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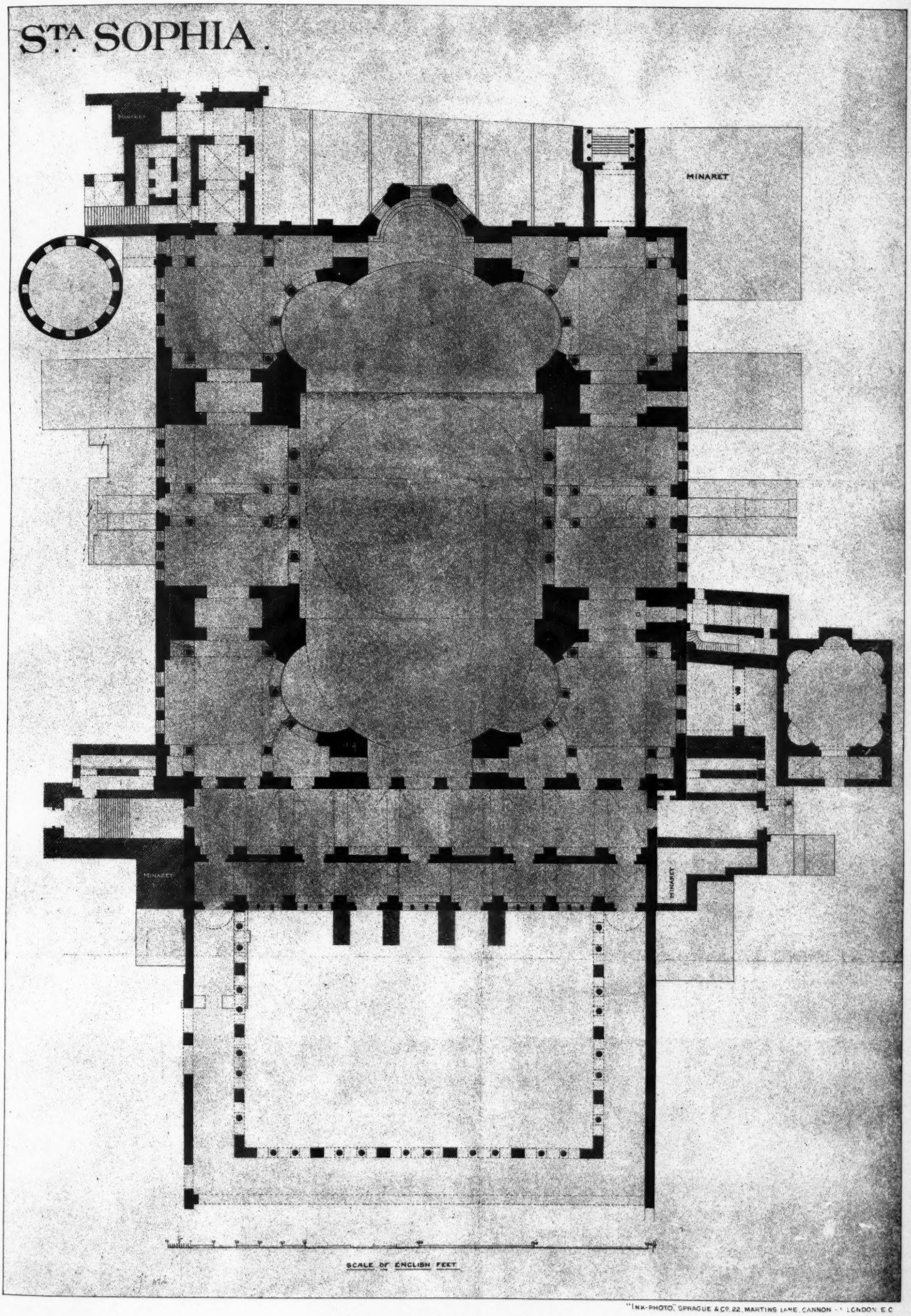
SECTION AND PLAN OF ST. SERGIUS, CONSTANTINOPLE.



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PLAN OF STA. SOPHIA, CONSTANTINOPLE.